PART 8
CONTRACT No. FSC 614
ENVIRONMENTAL HEALTH AND SAFETY & TRAINING REQUIREMENTS
Southern Waste Units/ OSDF Phase II

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A. ENVIRONMENTAL HEALTH & SAFETY AND TRAINING REQUIREMENTS MATRIX

A 1.0 General

The Environmental, Health & Safety and Training Requirements Matrix (EHS&TRM) has been developed FDF to aid the Contractor in identifying the Project and Site Specific hazards and controls associated with the project.

The matrix is a hazard assessment based on the current and planned operations for the project, it outlines the minimum Fluor Daniel Fernald (FDF) medical, radiological, safety and training requirements to the perform the listed activities. Additional safety requirements maybe required, if work conditions or planned operations change. The matrix does not relieve the contractor from recognizing and complying with other appropriate state and federal safety and health regulations.

The Contractor shall utilize the EHS&TRM to determine the general and task specific health and safety requirements in the development of their safe work plans. The EHS&TRM includes a hazard analysis for each task and required mitigators including personal protective equipment, engineering and administrative controls, pre-job planning and permits, personnel and air monitoring, medical monitoring and medical surveillance, and decontamination and disposal procedures.

All personnel shall have "Stop Work Authority" for any unsafe practice or any other condition that may cause injury or damage to personnel or property on or at an FEMP project. All FDF and Contractor personnel have the responsibility and authority to stop work when safety controls are inadequate.

In any situation in which stop work authority is used, the following requirements apply:

Exercise stop work authority in a justifiable and responsible manner;

Once work is stopped, do NOT resume until proper safety controls have been established; and

Resumption of work requires approval of FDF Construction manager with concurrence from FDF H&S Officer.

A.2.0 Safe Work Plans

The Contractor shall utilize the EHS&TRM to prepare the safe work plans required for performing each task. Only work that is planned and included in the Safe Work Plan (Part 7, ACR-002) may be executed.

ENVIRONMENTAL HEALTH & SAFETY AND TRAINING REQUIREMENTS MATRIX FOR THE SOUTHERN WASTE UNITS REMEDIATION, EXCAVATION PHASE

(Separate Attachment)

B. GENERAL SITE REQUIREMENTS

B.1.0 General

All work at the FEMP shall be performed in accordance with federal, state and local regulation and requirements provided in these contract documents, including programs of the U. S. Department of Energy (DOE), the U. S. Department of Labor 29 CFR 1910 and 1926 (OSHA), and the National Fire Protection Association (NFPA).

Fluor Daniel Fernald (FDF) and its contractors are required to comply with U.S. Department of Energy (DOE) Order 5480.4, "Environmental, Protection, Safety and Health Protection Standards," and DOE Order 440.1, "Worker Protection Management for DOE Federal and Contractor Employees," and FDF RM-0021, "Safety Performance Requirements Manual". Regulations and requirements pertaining to radiological controls on the project are relayed in Section C. The specific portions of these documents applicable to this Contract are delineated in Part 8.

B.2.0 General Safety and Health Provisions

B.2.1 Contractor Site Safety and Health Representative Responsibilities

B.2.1.1 Responsibilities

The Contractor must designate two full time Site Safety and Health (S&H) Representatives dedicated to this Contract with experience as defined below. One S&H Representative will be responsible for the work associated with the excavation at the Southern Waste Units and Haul Road use. The other S&H Representative will be responsible for the work associated with the On-Site Disposal Facility. The Safety Representatives will also work closely with FDF management in hazard recognition/prevention and ensuring prompt correction of safety deficiencies including participating in joint safety inspections at least once per week. The Contractor's Site S&H Representatives shall be responsible members of the organization at the site whose duty shall be the prevention of injuries and/or accidents, conducting documented daily inspections of work and storage areas, reporting safety related information, and maintaining applicable job site safety records. The S&H Representatives must have no other responsibilities and be independent of the Project management group, i.e. not report functionally to the Project Manager (unless the Project Manager is also a principal in the company). The S&H Representatives must not be responsible for cost and/or schedule. It is the intent of FDF that these Safety & Health Representatives are the same people throughout the project to provide consistency within the safety program.

The S&H Representatives shall be at the work site during all scheduled working hours including overtime and makeup work hours (the S&H Representatives need not be present when responding to dust alerts during non-working periods, unless explicitly directed by FDF. The Contractor may request approval to schedule overtime or makeup work without a S&H Representatives based on limited scope or minimal manpower requirements. However, this request must be in writing, and approved in advance by the Construction Manager.

Daily inspections shall be documented in either a bound hard cover journal or Lotus Notes Program. Entries will note the date and start and stop time, the person conducting the inspection and accompanying personnel, specific location(s) within the project being inspected, findings and mitigators. If a finding can not be mitigated, then record the interim measures taken and the FDF personnel the interim measures were reported to. The daily inspection documentation shall be available for review and turned into FDF at the end of the project.

FDF Approval

The S&H Representatives and any alternates must be approved by FDF before he/she is assigned to the project. Alternate S&H Representatives must be limited to scheduling conflicts of the S&H Representatives only. FDF reserves the right to approve/disapprove any S&H Representative or alternate which the Contractor may submit either before the project begins or during project execution.

For absences of the S&H Representative of less than four consecutive working days the Contractor may utilize a pre-approved alternate as the S&H Representative. The minimum criteria for an alternate is listed below. Normal job duties shall be effectively removed from the alternate while temporarily replacing the full time S& H Representative

For absences of the S&H Representative of more than four consecutive working days the Contractor must utilize a person that meets the minimum criteria listed below for a full-time S&H Representative.

FDF reserves the right to stop the work if the Contractor does not have an approved S&H Representative present at the work site. The Contractor shall be responsible for costs associated with work stoppage that results from not having an approved S&H Representative.

During execution of the contract, FDF reserves the right to assess the S&H representatives' or alternates' work performance based on the number of first-aid cases, recordable injuries, lost time injuries, contamination incidents, safety violations and understanding and commitment to safety. FDF reserves the right to require replacement of either of the Contractor S&H Representatives or alternates when performance is unsatisfactory.

The S&H Representatives must meet the following criteria:

5 years verifiable applied safety and health experience, with 3 years of that time in the construction industry as a full time safety professional.

1 year verifiable experience as a safety professional providing oversight/ direction to a work force using Level C Personal Protective Equipment (PPE) as defined in section B.4.2 or greater protection.

Must be able to demonstrate adequate safety knowledge of 29 CFR 1926 and 1910 standards (OSHA).

Must be able to effectively implement a safety program for this project.

Must be able to manage injuries/illnesses as well as accident prevention.

Must be able to keep documentation accurate and up to date as required by the terms and conditions of this Contract as well as those requirements as identified by OSHA or other regulatory agencies.

Alternate S&H Representatives who fill in for the S&H Representative for less than four consecutive working days must meet the following criteria:

Six months verifiable applied safety and health experience in the construction industry as a construction safety officer

NOTE: This is the minimum criteria (responsibilities) for a Contractor S&H Representative or alternate to meet at the time of pre-approval by FDF. Any other requirements either contractually or required by OSHA and other regulatory agencies shall be complied with. Failure to meet this requirement at the time of pre-mobilization may result in a default of this Contract.

B.2.2 Fluor Daniel Fernald Safety Handbook

Each Contractor employee will be provided with a copy of the FDF Safety Handbook upon arrival on site. The Contractor management, supervision, and employees are required to read, understand and abide by the handbook. Each Contractor or Subcontractor employee will be required to sign an acknowledgment sheet signifying that they understand the requirements.

B.2.3 Monthly Manpower Report

The Contractor shall submit to FDF by the third day of each month a manpower report. The report shall list the Contractors name, total work hours, number of injuries and a brief description of the injury. Required information shall be reported for the Contractor and all of its Subcontractor's who performed work for FDF during the previous calendar month.

B.2.4 Natural Occurrence (Weather)

Weather affected work will be stopped if lightning, heavy persistent rain, wind, or other adverse weather conditions are in the area. Weather suspended due to lightning shall not restart until 30 minutes after the last lightning flash. This includes any weather conditions whose impact is judged to be detrimental to safety by FDF.

When sustained wind velocity equals or exceeds 25 mph or wind gusting equals or exceeds 35 mph, suspend outdoor operations utilizing:

portable ladders being used above the ground.
unsecured scaffolding (use of scaffolding will be based on the engineering design of the scaffolding

aerial lifts (where manufacturers recommendations are different comply with manufacturers recommendation)
drill rigs
Other operations where personnel are working at unprotected heights (ex. Roofs without guardrails, work requiring personnel fall arrest systems)
large area sheet materials (eg. liner material, etc.)

Requirements for crane use during high wind events is covered in the FDF Hoisting and Rigging Manual.

B.2.5 Fluor Daniel Fernald Permits

FDF permits required for this Contract are shown on the EHS&TRM, Part 8 A. The Contractor is responsible for requesting (in writing) required permits prior to starting a task.

Work Permit - A work permit is required for each new unrelated task.

PERMIT	WHEN IS IT REQUIRED?	DURATION OF PERMIT
Work Permits	Must be obtained prior to any start of work activities. A work permit is required for each new, unrelated task This permit provides the employees with the basic requirements to complete the work task. i.e..PPE specifications and supplemental permits. Must have signed work permits in order to obtain a confined space, Chemical Hazardous Materials, Open Flame/Welding, Asbestos, Facility Outage, or Excavation Trenching/Penetration permits.	Permit expiration dates correspond with work scheduling dates. An extension on a work activity may require renewal of the work permit.

PERMIT	WHEN IS IT REQUIRED?	DURATION OF PERMIT
Cutting, Welding/Open Flame Permits	Required for performing hot work which includes welding with electric arcs, oxy-fuel gas flames, grinding, brazing and any open flame activity.	Permits are typically terminated after one working day but may be written to last for several weeks at the discretion of FDF safety. An example of an extended permit would be the cutting of rebar repeatedly in a hazard free area. Fabrication areas may receive thirty day permits.
Chemical Hazardous Material Permit	This permit must be obtained prior to any work activities with chemicals, chemical products or hazardous materials for which a MSDS is required by OSHA and there is a potential for exposure approaching regulatory limits. i.e..carcinogens, biological hazards (bird droppings), organic solvents and acids or caustics. Also required when former hazardous material lines are initially broken.	This permit can have the same expiration date as the completion date which is listed on the Work Permit.

PERMIT	WHEN IS IT REQUIRED?	DURATION OF PERMIT
Penetration	This permit is required anytime a penetration into the ground/earth is made for depths greater than 6 inches. This also includes excavation activities. Utilities within 20 feet of excavating penetrations into the ground/earth must be listed on the Penetration permit and marked in the field. This permit is also required for any intrusive work inside of buildings and on floors. If penetration area or excavation change in any form the permit is invalid and a new permit must be obtained. No "Blanket Permit" is allowed, each individual penetration must be identified on the permit.	Penetration Permits are only valid for 6 months from date of issue and a copy of the permit is to be posted at the work site.
Radiological Work Permit	This permit is required to inform workers of area radiological conditions and entry/exit requirements. Refer to Section C, C.2.8 for details.	
Facility Outage Permit	This permit is required prior to the closing of any roadway, sidewalk, fire exit, electrical system, interruption of utility, telephone, fire protection system or alarm system. The permit shall specify what will be impacted and what controls are required.	
Asbestos Permit	This permit is required for any Class I, II or III asbestos work performed at the FEMP and for Class IV asbestos work performed inside a Class I, II or III asbestos regulated area.	

PERMIT	WHEN IS IT REQUIRED?	DURATION OF PERMIT
Confined Space Evaluation/Permit	This permit is required prior to any entry into a confined space.	

B.2.6 Required Safety Meetings

Prior to starting work on the project, each Contract employee shall attend a pre-work safety meeting presented by the Contractor to review the safe work plan, and/or other safety requirements.

The Contractor and Subcontractors shall hold a 30 minute tool box safety meeting on Monday or first work day of each week to reinforce safety and to discuss a Contractor developed safety topic related to the project. To supplement the Contractor's safety topics, FDF will provide safety bulletins and safety videos for use in these meetings. A written record of attendance and topics covered shall be maintained by the Contractor at the FEMP site.

All personnel performing work activities will receive from Contractor supervision at a minimum a safety briefing at the start of the day, after lunch and at the start of any new work activity. The briefing shall last approximately ten minutes and address hazards, mitigators and controls listed in the Contractor's Safe Work Plan, normal construction hazards and related actions to perform work safely.

All safety meetings shall be conducted in a manner that allows active participation by employees.

B.2.7 Housekeeping

Areas where personnel are expected to walk shall be free of debris. Debris shall be removed as soon as possible or at the end of each shift. Daily documented inspections shall be made by the Contractor to ensure that housekeeping is maintained.

B.2.8 Dry Sweeping

Dry sweeping is not allowed in a Radiological Contamination Area. Clean-up shall be done using vacuum cleaners or another non-airborne generating method approved by FDF.

B.2.9 Competent Person Inspection

Where OSHA or this Contract requires inspections by a competent person, the inspections shall be documented by log, form or other means and maintained in a file in the Contractor's facilities at the site.

The Contractor shall submit and maintain a list of all known competent persons including their qualifications and certifications 15 days prior to need.

The Contractor shall provide names and qualifications including certification of training, of

the following competent persons to be used on this Contract:

Fall Protection/Arrest Inspection and Training;
Lock and Tag Inspection;
Scaffold Inspection;
Ladder Inspection;
Excavation Inspection;
Crane Inspection;
Motorized Equipment Inspection;
Equipment Inspection;
Rigging and Hoisting Inspection;
Asbestos Work; and
Lead Work;
Fire Extinguisher Inspection
Laser Operation

B.2.10 Emergency Communications

At least one 2-way radio on FEMP frequency furnished by the Contractor shall be available at all times at all remote locations (wherever the FEMP Emergency Message System is not audible) in order for the Contractor to be able to communicate any emergency condition and receive FEMP site emergency communications. If the Contractor is working in a location where the FEMP Emergency Message System is audible, the method to communicate may be a radio or one of the following:

Site telephone
Cellular phone furnished by the Contractor

To report emergencies on site by phone, dial 648-6511 or by radio, switch to Channel 7 and call CONTROL. The Contractor shall post the correct numbers at the work site.

B.3.0 Occupational Health and Environmental Controls

B.3.1 Required Medical Monitoring

In accordance with 29 CFR 1926.65, "Hazardous Waste Operations and Emergency Response, Occupational Safety and Health Standards," all personnel assigned to a FEMP project and performing actual tasks are required to participate in the FDF medical monitoring program.

If an outside medical resource is utilized to provide any portion of the monitoring program, the Contractor must receive prior written authorization from the FDF Medical Director who shall have final authority for approval of external medical monitoring programs. FDF Medical Services will provide minimum requirements protocols for prospective Contractors. Medical documentation showing that personnel meet minimum requirements shall be submitted in a sealed envelope marked "SENSITIVE" to the FDF Medical Director, Mail Stop 30, with a copy of the transmittal to FDF Construction Document Control. Submittals for conformance review by FDF Medical Services shall be submitted at least eight working days prior to performing work. Medical approval must be received prior to performing work. FDF will provide a list of pre-approved outside medical resources upon request.

Costs for Contractor personnel and for medical services performed by an outside medical resource shall be borne by the Contractor.

When medical monitoring services are provided by FDF, FDF bears the cost of medical services and the Contractor bears the cost of Contractor personnel wages, etc.

B.3.1.1 General Programs

Contractor employees will be required to undergo medical examinations as indicated in the EHS&TRM. The Contractor shall make employees available for such examinations.

Special medical (health hazard) monitoring requirements as prescribed by 29 CFR 1926, "Safety and Health Standards for Construction;" 29 CFR 1926.65, "Standards for Hazardous Waste Operations; other Federal, State or local statutes; and specific site Health and Safety Plans, may be fulfilled by sources outside of FDF (e.g., lead and associated tests). Documentation including copies of medical examinations, and laboratory or other testing including biologic monitoring shall be provided to the FDF Medical Director as described above. Biological monitoring requirements will be based upon the EHS&TRM.

The Contractor is responsible for notifying employees that no food or drink shall be consumed after midnight prior to scheduled medical pre-assignment monitoring. Any employee related costs caused by employees eating or drinking after midnight shall be at the Contractor's expense.

Workers shall register prescription medicine with FDF Medical and report any open wounds prior to entry into a Controlled Area. Workers with wounds that cannot be covered are

restricted from working in Radiological Areas.

Use of Prescription Medicine

Non-prescription medicine shall not be taken into Controlled Areas with the single exception of Glucose Tablets which may be taken by diabetics. Employees that need Glucose Tablets shall register with the FDF Medical Department.

Prescription medicine will only be recognized by FDF after the employee to whom the medicine is prescribed registers the medicine with the FDF Medical Department.

Employees that must take prescription medicine on a schedule should, first, try to coordinate their schedule so that they may take their medicine on the administrative side of the site. If this is not possible, prescription medicine shall only be taken in a designated drinking water area or designated break room.

In the event of an emergency an employee may take prescription medicine on the spot, regardless of the area in which he or she is standing. If medicine has been taken under these conditions, the employee shall contact FDF to determine what action, if any, will be required of the employee in regards to dosimetry.

Contractor employees receiving medical treatment with radio-pharmaceuticals will be restricted from entering Controlled Areas until such time as the radio-pharmaceutical has cleared sufficiently from his/her system to the point where frisking through a Personal Contamination Monitor (PCM) at the control point does not trigger the alarms. Contractor employees that are to receive such treatment shall report to FDF Medical Services beforehand so appropriate precautions can be taken. Employees that have received treatment with radio-pharmaceuticals shall report to Medical immediately upon returning to work.

Contractor employees that are pregnant shall report to FDF Medical. The employee will be informed of risks related to her pregnancy as a result of working on the Contract. The employee may "Declare Pregnancy" in accordance with 10 CFR 835. If declared, FDF will ensure that the employee's thermoluminescent dosimeter (TLD) is read monthly (as opposed to quarterly). FDF's administrative control limit is 50 mrem/month or 400 mrem/gestation period.

B.3.1.2 Medical Services

The EHS&TRM (Part 8 Section A) contains information on project specific hazards to which workers may be exposed. In addition, those introduced by the Contractor would be identified on Contractor supplied MSDS sheets. FDF Medical Department has the following Medical Monitoring Programs (including all of the laboratory, x-ray, and other testing ordinarily included in the Biologic Monitoring Program) in place for workers with potential exposures:

Asbestos Worker;
Hazardous Waste Worker (including radiation);
Lead Worker (and other heavy metals); and

Hearing Conservation.

Some workers are required by regulation to be entered into a long-term Health Surveillance Process Program, however, FDF cannot provide nor be responsible for these longer term programs for Contractor employees. Other Standards of Care/Practice in Industrial Hygiene, Occupational Medicine, or Health Physics may also dictate special testing or programs for some workers. The Contractor is responsible for these requirements. Additional surveillance or monitoring requirements may be generated from the Contractor's method of performing work or for materials used (i.e., such as indicated by hazardous components on MSDS).

The Contractor will be required to complete an access form for each Contractor employee, contained in EXHIBIT "1", which will be used to identify the job classification (i.e., Operating Engineer, Laborer, Clerk) for the employee. FDF Medical will use this information to determine FDF provided monitoring requirements. The durations for physicals listed in EXHIBIT "2" include any medical time necessary for this monitoring.

The FDF Medical Director will be the final authority to determine the fitness of any worker or his/her suitability to perform work and be exposed to any of the various hazards at the FEMP.

B.3.1.3 Reporting Injuries and Accidents

All injuries and illnesses, no matter how minor, resulting from work performed at the FEMP shall be reported to the FDF Medical facility when they occur. The employee's supervisor shall accompany the employee to Medical. The employee's supervisor shall complete the FDF "Supervisor's Report of Injury" form and return it to the FDF Medical Facility within 24 hours of the injury. The form will be provided to the Supervisor at the time the injury is reported to medical.

The Contractor shall also report all accidents and injuries to the FDF Construction Manager and the Project Health & Safety Officer when they occur.

In the event of a serious accident, injury or event the involved area shall not be disturbed until approved by FDF.

The Contractor shall provide FDF reports and support FDF investigations into accidents, illnesses, and injuries as required by FDF. This shall be in addition to the Contractor's own investigation.

The Contractor shall investigate accidents, injuries, illnesses and near misses to determine the root cause and methods to prevent future occurrences. A written report shall be provided to FDF within three working days after the incident.

Within 24 hours after an OSHA Recordable injury or illness, the Contractor Project Manager and the appropriate S&H Representative shall meet with FDF Construction Manager to fully explain what caused the event and what preventive measures will be taken to prevent a recurrence.

B.3.1.4 Exit Physicals

Prior to leaving site, personnel working on Contract work shall take an exit physical unless they have had a FDF physical in the past six months.

B.3.2 Safety Showers/Eye Washes

When required by the EHS&TRM or product MSDS, a safety shower/eyewash shall be located within 100 feet of the hazard and require no more than ten seconds to reach. Any safety shower/eyewash shall be maintained and tested by the Contractor according to the manufacturers recommendation. Inspections, maintenance and testing shall be documented by the Contractor. All portable safety showers/eye washes furnished by the Contractor and brought on-site must comply with ANSI Z 358. For small quantities of hazardous materials, the Contractor may request a variance from FDF. Approval of a variance shall be at the sole discretion of FDF.

B.3.3 Sanitation

Drinking water shall be made available for Contractor personnel at the work site and Contractor office areas by the Contractor.

All drinking water locations within Controlled or Radiological Areas shall be approved by FDF Radiological Control and FDF IH prior to use.

Hand washing facilities or approved sanitation supplies shall be provided for by the Contractor for Contractor personnel at eating and restroom areas. These washing and sanitation areas shall be maintained in a sanitary condition.

B.3.4 Occupational Noise Exposure

The Contractor shall adhere to the current American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), which establish an eight- hour threshold limit value - time weighted average (TLV-TWA) of 85 decibels A-weighted (dBA), and a 3 dB doubling rate.

The Contractor shall institute feasible engineering or administrative controls when the noise exposure or noise dose of Contractor personnel is equal to or greater than an eight-hour TLV-TWA of 85 (dBA). Engineering or administrative controls shall be designed to reduce exposures to the TLVs for noise as specified by the ACGIH.

The Contractor shall provide hearing protection for contractor personnel and enforce its use when the noise exposure or noise dose of Contractor personnel is equal to or greater than 85 dBA for any duration of time. The Contractor shall be responsible for obtaining noise level data including monitoring to ensure worker safety.

B.3.5 Illumination

Work areas shall be lighted to not less than five (5) foot candles per ft^2. Any portable lighting shall be arranged as not to create a personnel burn hazard.

B.3.6 PACM in the Project Work Area

Presumed Asbestos Containing Material (PACM) is suspected to be present in the Southern Waste Units Excavation work area. Although there was no known "approved" disposal of Asbestos Containing Materials (ACM) in this area, past experience has shown that there are materials that are considered PACM in the Inactive Flyash Pile and South Field. The location, type, and quantity of PACM which may be present is not known at this time. Materials that have been discovered include (but are not limited to) the following:

Transite Panels,
Floor Tile, and
Pipe Lagging with thermal system insulation still attached.

OSHA regulations at 29 CFR 1926.1101(b) define Presumed Asbestos Containing Material (PACM) as thermal system insulation and surfacing materials found in buildings constructed no later than 1980. The designation of material as PACM may be rebutted pursuant to 29 CFR 1926.1101(k)(5).

If the contractor chooses to rebut the classification of PACM to materials discovered in the project area, it will be at their cost. FDF will assume all materials meeting the definition of PACM does contain asbestos unless the Contractor proves otherwise.

B.3.7 Training for PACM Handling

The Contractor shall ensure:

Its asbestos competent person personnel are trained in accordance with Appendix C to Subpart E of 40 CFR Part 763.

Its (inclusive of Subcontractors) workers who are required to handle PACM have attended training as specified in 29 CFR 1926.1101 (k)(9)(viii). This training requirement can be met by attending FDF Asbestos O&M training (course # 1868) along with reviewing the asbestos work practices with the appropriate workers.

Its (inclusive of Subcontractors) workers who may come into contact with PACM, but who are not required to handle PACM, have attended Class IV asbestos awareness training as specified in 29 CFR 1926.1101(k)(9)(vi).

B.3.8 PACM Handling Plan

If the Contractor is subcontracting asbestos work, the Contractor shall submit the Subcontractor's PACM Handling Plan.

The PACM Handling Plan shall contain the following information at a minimum (additional

requirements are presented in the technical specifications):

Any employee exposure assessments which have been completed for closely resembling asbestos activities which will be used to assign protective clothing and respiratory protection for asbestos work.

Method to ensure that an employee exposure assessment has been completed by the competent person prior to the start of asbestos work, or as soon as practical after the start of asbestos work. Protective clothing, respiratory protection, hygiene requirements and work practices shall be determined based on the results of the exposure assessment.

Personnel decontamination methods (routine and medical emergency situation) for workers required to handle PACM. See EXHIBIT "3", "Personnel Decontamination for PACM Waste Handling Work Performed in Radiological Contamination Areas" for routine requirements until a negative exposure assessment has been completed.

Within 10 days of Notice to Proceed (NTP), the Contractor shall provide:

Name(s) of, and documentation of training for, the asbestos competent person personnel.

Names of, documentation of training for, and documentation of medical fitness to perform the work, for all personnel assigned to handle PACM encountered during excavation. Documentation of medical fitness to perform work shall be provided in the form of medical certification (physician's written opinion for respirator usage), documentation of respirator training, and documentation of quantitative fit-test. See Part 8, Section A.3 , Required Medical Monitoring, for requirements related to outside medical resources.

Documentation that its (inclusive of Subcontractors) workers who may come into contact with PACM, but are not required to handle PACM, have attended Class IV asbestos awareness training.

B.3.9 Employee Air Monitoring

The Contractor shall perform air monitoring to ensure compliance with the employee exposure assessment requirements of OSHA. The Contractor shall bear the cost of sampling and analysis. FDF shall provide sampling and analysis for radiological contaminants. Sampling and analysis shall be performed using NIOSH or OSHA analytical methods. All air monitoring analysis provided by the Contractor shall be performed by an American Industrial Hygiene Association approved laboratory which was rated proficient in the last Proficiency Analytical Testing Program.

Contractor employees may be required to wear personal air samplers to monitor their exposure to airborne contaminants as indicated in the EHS&TRM.

The Contractor shall ensure the results of any personal air monitoring (required by OSHA) performed by the Contractor or a Subcontractor, are provided to FDF in a format (worker name, social security number, date of sample, activity sampled, contaminant sampled and sample result) so the information may be forwarded to FDF Medical Services for their use in medical monitoring of the Contractor's workers. The Contractor shall provide results of general area monitoring to FDF, including sample data, location activity, containment, and sample result.

When air monitoring is conducted in airborne radiological areas:

The Contractor shall ensure the laboratory which receives samples collected in airborne radiological areas maintains a Nuclear Regulatory Commission (NRC) or Agreement State License to accept low-level radioactive samples for analysis.

The Contractor shall provide documentation of the laboratory's original NRC or Agreement State License before collecting of any samples.

The license shall authorize the possession of the radio nuclides listed below in health protection samples, as laboratory standards and calibration sources, and for use in research and development activities. The laboratory's nuclear materials license shall allow, at a minimum, for the possession of the following amounts of radio nuclides:

Radionuclides	Microcuries
U-238 and progeny	25 each
U-235 and progeny	25 each
Th-232 and progeny	25 each
Pu 238, 239, 240	5 total
Pu 241 and progeny	1 each
Sr-90	1
Cs-137	1
Tc-99	5

B.3.10 Lead Contaminated Soil Area:

A Lead Contaminated soil area has been identified in the SWU Excavation. Based on previous soil samples (less than 1% lead), the work in this area will not be considered "Lead Abatement" activities. Additional training and controls for this activity are spelled out in the SWU Excavation EHS & TRM.

B.3.11 Lead, Chromium or Cadmium Prohibitions

The use of solder or flux containing more than 0.2% lead or cadmium is prohibited. Paints or other products containing lead or chromium are not permitted onsite.

B.3.12 Hazardous Chemicals

B.3.12.1 Chemical Approval

The Contractor shall submit to FDF for compliance review a list of all chemicals anticipated to be used onsite by their employees and all Subcontractor employees. The list shall include the identity of the chemical, the manufacturer, the quantity to be brought on site, the application (ie. lubricant, paint, etc.) and the specific location (confined spaces, pads, etc.) where it will be used. A legible copy of the most current MSDS for each chemical to be used shall accompany this list. The list and associated MSDS shall be submitted to FDF within ten calendar days of Notice to Proceed. Chemicals in excess of project requirements shall not be brought on site.

The Contractor shall update the list each time additional chemicals are identified. A legible copy of the most current MSDS for each chemical used shall accompany any revisions. Revisions shall be formally transmitted to FDF Construction Document Control with a FAX copy to FDF for compliance review by Industrial Hygiene at least two work days prior to the chemical arriving at the FEMP site. FDF IH will notify the FDF Construction Manager of any deficiencies.

B.3.12.2 Carcinogen Control

The Contractor shall comply with the requirements of the FDF Carcinogen Control Program. This program establishes requirements for the identification, evaluation and control of occupational exposure to chemical carcinogens. The major elements of the Carcinogen Control Program are summarized in this section.

B.3.12.2.1 Carcinogens

Occupational carcinogens regulated by this program include:

Those substances regulated as carcinogens by OSHA in 29 CFR 1926, Subpart D and 29 CFR 1926, Subpart Z;

Those substances that have been evaluated by the International Agency for Research on Cancer and found to be a carcinogen or potential carcinogen (i.e., Groups 1, 2A or 2B);

Those substances listed by the U.S. National Toxicology Program as known to be carcinogenic or reasonably anticipated to be carcinogenic; and

Those substances categorized as a confirmed human carcinogen or suspected human carcinogen (i.e., A1 or A2) by the ACGIH.

The requirements of this program apply to all regulated occupational carcinogens when the carcinogen is present in its pure form or in concentrations of 0.1 percent or greater. The requirements of this program are not applicable to control of asbestos and radioactive materials.

B.3.12.2.2 Purchase Requirements

Regulated occupational carcinogens shall be brought onsite only after a technical/engineering

evaluation has been performed and documented by the Contractor which justifies that no feasible substitute is available.

Hazardous chemical approval must be obtained from FDF prior to the purchase of any regulated occupational carcinogens.

B.3.12.2.3 Use Requirements Controls

The following controls shall be implemented when it is necessary to use a regulated carcinogenic material:

Safety plans, standard operating procedures or experimental protocols shall be written describing the use of the occupational carcinogens and the procedures used to control exposure. These documents shall be reviewed and approved by FDF prior to use of the carcinogen. Plan submittal shall be made at least 15 calendar days prior to use. To expedite submittal.

Engineering controls shall be the primary method used to minimize exposure to carcinogens and to prevent the release of carcinogens into the work environment.

Administrative and/or personal protective equipment controls shall be implemented to supplement engineering controls in order to minimize exposure to carcinogens. Warning signs indicating the presence of carcinogens shall be posted at the entrance to all regulated areas. Regulated areas shall be established where carcinogens are used. Steps shall be taken to control access to a regulated area, and a record maintained of all personnel working in the regulated area.

Worker training/information for use of carcinogens shall be in compliance with information/training requirements established in 29 CFR 1926.59.

B.4.0 Personal Protective Equipment

Radiological Requirements for PPE are listed in Section 8 C. The FDF Industrial Hygiene and Radiological Control PPE requirements will be coordinated for the work to be performed and relayed in the job-specific FDF Work Permit/RWP for the task. Tasks that involve multiple hazards (e.g., asbestos and radiological contamination) will require two layers of contamination clothing and will also be incorporated into the applicable job-specific FDF Work Permit/RWP.

B.4.1 FDF Supplied Personal Protective Equipment:

Dosimeter badge (if required);
Launderable contamination clothing (yellow)
Launderable, fire retardant- nomex, contamination clothing (orange)
Latex rubber shoe covers (yellow)
Full Face Air Purifying Respirators (excluding cartridges and Powered APRs)

The Contractor shall supply the following PPE and ensure that all personnel wear the appropriate PPE at all times within the construction areas:

Hard hats (ANSI Z 89.1)
Safety glasses with rigid side shields which meet or exceed ANSI Z87.1.
Leather steel-toed safety boots which meet or exceed ANSI Z 41 (Alternate footwear for specific work activities, such as liner installation, must be approved by FDF prior to use.
Brightly colored red or orange traffic safety vest.

B.4.2 Disposable Contamination Clothing

Disposable anti-C's shall be supplied by the Contractor and shall meet the requirements of Part 7, ACR-005, Disposable Contamination Clothing, found in Part 7 - Technical Drawings & Specifications. Specific requirements are defined in the EHS&TRM. Disposables cannot be reused.

A full set of Anti-C's shall consist of (at a minimum):

Coveralls;
Hoods (may use skull caps (supplied by FDF) in place of hoods if not wearing respiratory protection, as approved by FDF);
Shoe Covers;
Latex Rubber Shoe Covers (supplied by FDF);
Duct Tape;
Cotton Glove Liners (optional);
Nitrile Gloves; and
Cotton Gloves or Other Work Gloves (as required based on work activity).
Respiratory Protection (APR's or PAPR's as required on the Work Permit for the job being performed).

B.4.3 Head Protection

All hard hats shall be ANSI Z89.1 listed. Hard hats are to be worn at all times, brim forward, within a defined construction work area. "Soft-cap" welding is not permitted. Welding hoods are to be affixed to hard hats.

B.4.4 Minimum Dress Requirements

All personnel working in the construction work area shall wear, at a minimum, long pants and shirt with four-inch or longer sleeves, steel-toed leather safety boots, safety glasses, brightly colored red or orange traffic safety vest and a hard hat.

B.4.5 Eye Protection

All eye protection shall comply with American Standards Institute (ANSI) Z87.1. Rigid side shields are required with safety glasses. Safety glasses are a minimum requirement for entrance to the controlled area of the site and for all construction areas.

B.4.6 Respirator Requirements

B.4.6.1 Respiratory Protection

Respiratory protection is required whenever the likelihood of airborne concentrations of chemical hazards (1) exceed one half the OSHA Permissible Exposure Limit (PEL) or ACGIH TLV, which ever is most restrictive; (2) exceed one half of any applicable short-term exposure limit; (3) as required by specific OSHA standards (i.e., asbestos, lead); (4) or as required by MSDS for materials used.

B.4.6.2 Radiological Contaminants

See Part 8C, "Radiological Requirements," for respiratory requirements in a radiologically contaminated environment and EXHIBIT "5", "Respirator Reuse Criteria."

B.4.6.3 Contractor's Respirator Program

The following criteria are required by the FDF respirator program and shall be incorporated into the Contractor's respirator program as appropriate:

Shall comply with all DOE Orders, OSHA regulations and ANSI Z88.2-1992 requirements with regard to respiratory protection.

The FDF Respiratory Program Administrator (or his designee) shall approve any exemptions from the FDF Respiratory Protection Program.

See Part 8 Section B 3.1, Required Medical Monitoring

Personnel shall be certified and fit-tested with the same type of equipment they will be utilizing at the FEMP. Quantitative fit-testing will be provided by FDF. If the Contractor chooses not to utilize FDF fit testing, quantitative fit testing will be performed with fit test records provided to FDF. The fit test records will include the observed fit factors. Fit factors shall be greater than ten times the protection factor for negative pressure respirators.

All respiratory protection equipment used on the FEMP site shall be NIOSH approved. The Contractor shall ensure that all respirator equipment is properly maintained. FDF shall supply the following respirators:

North Model 7700 Silicone Half-mask Air Purifying (Small, Medium, Large);
MSA Comfo II Silicone Half Mask Air Purifying (Small, Medium, or Large);
MSA Silicone Ultra Twin Full-Face (Small, Medium, or Large); and
MSA Silicone Ultra Vue Full-Face (Small, Medium, or Large).

All cartridges shall be supplied by the Contractor.

Where Powered Air Purifying Respirators (PAPR's) are required by this Contract or by law,

the Contractor shall supply adapters for the air purifying respirators listed above and all other required appurtenances. The Contractor shall also be responsible for supplying any necessary support equipment to maintain the PAPRs. Support equipment will include: battery chargers, charging racks, belts, and cleaner/sanitizer.

The Contractor shall provide the appropriate type of PAPR based on anticipated hazards. The appropriate PAPR shall be determined by FDF Radiological Engineering and FDF Industrial Hygiene.

Chemical hazard work respirators and those used for asbestos work (face piece and cartridges) shall be required to be recycled each time they are removed when leaving the work area. Respirators being used for asbestos work shall be bagged and an asbestos warning label affixed before they are placed in the recycling receptacle. Approval by the FDF Respiratory Program Administrator shall be required for reuse of cartridges other than particulate cartridges.

At the end of the shift or job, whichever is sooner, respirators shall be separated from their cartridges and the cartridges discarded. Respirators shall be placed into a FDF furnished green and white recycling receptacle. The same respirator shall not be used for more than one shift.

A respirator or cartridge may be re-used by an individual during a work shift if it is not used for asbestos or chemical work and is kept clean and radiologically uncontaminated. At the end of the workday, respirators must be turned into FDF.

If respirator or cartridge reuse is desired, see EXHIBIT "5".

Cleaning and repair of respirators, except PAPR adaptors and appurtenances, shall be the responsibility of FDF.

FDF will supply clean reconditioned and inspected respirators, as required, at the Jobsite. Respirator issuance will be by FDF at the access control point. Contractor personnel will be required to check out the respirator individually by presenting their badge and having the issuer record information in the log.

The Contractor shall complete a daily FDF respirator request form to obtain respirators for the next day's use. Requirements for weekends must be included in the request made on Thursday.

All respirators are required to be tracked on site. FDF supplied tags bearing a unique number shall be placed on every respirator to be used on this site.

B.4.7 Working Over or Near Water

Employees working over or near water, where a water drowning hazard exists, shall be provided with a U.S. Coast Guard approved life jacket or buoyant work vest. Prior to and after each use, the buoyant work vests or life preservers shall be inspected for defects which

would alter their strength or buoyancy. Defective units shall not be used. Ring buoys with at least ninety (90) feet of line shall be provided and readily available for emergency rescue operation. The distance between ring buoys shall not exceed 200 feet. At least one life saving skiff shall be immediately available at locations where employees are working over or adjacent to water. A water drowning hazard may be defined as any one of the following, but not limited to: Three (3) feet or more of standing water where personnel could fall into or are within 5 feet of the waters edge or where basin/pond embankment slopes of 2:1 or steeper lead directly into water.

B.5.0 Fire Protection

B.5.1 Temporary Enclosures

Temporary enclosures constructed for any reason shall meet the following fire protection requirements:

Temporary enclosures shall not be supported by automatic sprinkler piping or other fire protection equipment;

The enclosure supporting structure shall be constructed of noncombustible or approved fire retardant materials;

The coverings for walls, floors, and ceilings shall be noncombustible or approved fire retardant materials;

The enclosure and an area of ten feet around the enclosure shall be posted as "no smoking" areas;

Combustible materials shall not be stored in the area surrounding temporary enclosures;

Combustible materials used within the operation of an enclosure shall be removed immediately after use or transported to and stored in approved metal containers with lids. All combustible waste shall be removed from the enclosure after each work shift.

Exits shall be kept unobstructed at all times;

Work requiring an open flame, abrasive cutting, grinding or other hot work shall not be permitted within an enclosure, without an approved Open Flame and Welding Permit; and

Portable fire extinguishers shall be provided and positioned for easy visibility and access.

B.5.2 Flammable/Combustible Liquids Use & Storage

A. The Contractor shall follow the requirements of NFPA 30 - The Flammable & Combustible Liquids Code (the most recent edition), OSHA 29 CFR 1910.106 - Flammable & Combustible Liquids when utilizing or storing flammable or combustible liquids at the FEMP. Only Underwriters Laboratories (UL) or Factory Mutual (FM)

approved tanks shall be used. FDF Fire & Safety Department shall approve tanks and locations prior to the arrival of the tank on site. Once a location has been established, it shall not be relocated without approval of FDF Fire & Safety.

The following requirements of the Fernald Environmental Management Project Plan PL-2194, Spill Prevention Control and Countermeasure (SPCC) Plan shall be met:

Container or portable tank storage shall be defined as the storage of liquids in drums or other containers not exceeding 60 gallon individual capacity and portable tanks no exceeding 660 gallon individual capacity and limited transfers incidental thereto.

The volumetric capacity of required secondary containment (diked area) shall not be less than the greatest amount of liquid that can be released from the largest tank within the diked area, assuming a full tank. To allow for volume occupied by tanks, the capacity of the diked area enclosing more than one tank shall be calculated after deducting the volume of the tanks, other than the largest tank, below the height of the dike.

Walls of the diked area shall be of earth, steel, concrete, or solid masonry designed to be liquid tight and to with stand a full hydrostatic head. Curbs shall be a minimum of 6 inches high.

To permit access, the outside base of the dike at ground level shall be no closer than 10 feet to any property line that is, or can be built upon.

Provisions shall be made for removal of accumulations of storm water or spills of liquids.

These facilities should be located where they will not be subject to periodic flooding or washout.

B.5.3 Portable Fire Extinguishers

Contractors shall provide FM Approved or UL Listed portable fire extinguisher(s) for all work, storage and trailer locations (OSHA 1926 Subpart F). Ordinary hazard areas shall require a 2A-20BC rated extinguisher within 50 feet of all work task area(s). NFPA 10 shall be followed for all fire extinguisher requirements. Inspections shall be in accordance with the Contractor Fire Extinguisher Inspection Procedure, Contract, Part 7 (ACR - 003).

B.5.4 Temporary Heating

The Contractor shall provide all temporary heat and heating equipment required for performance of the Contract. Fuel heating systems require 24 hour coverage by the Contractor. Ensure portable heaters are "UL", "FM" or "AGA" certified/listed for their intended use, and are not modified for other applications. Only use heaters according to the manufacturer's recommendations regarding adequate ventilation, clearance and other defined hazards. The use of any fuel-fired heaters must be submitted and approved by FDF Safety prior to use.

B.5.5 Smoking Locations

The use of smoking materials, such as cigars, cigarettes, pipes, etc., will not be permitted in the work area or any area with combustibles about. The contractor may setup defined, designated smoking locations with the approval of FDF safety. Smoking while operating equipment will not be permitted. Any location to be considered must, as a minimum have the following: non-combustible butt can, signs to designate, and not be in the active work areas.

B.6.0 Hoisting and Rigging Requirements

B.6.1 General

The Contractor shall comply with the following Hoisting and Rigging requirements, and the requirements of FDF Hoisting and Rigging Manual Section 15 , which meets the requirements of the DOE Hoisting and Rigging Manual and will be made available upon request after award.

The Contractor shall prepare a Lifting Plan prior to making any lifts. Plans for lifts over 2,000 lb's. shall be submitted for compliance review to FDF.

Lifting Plan - A lifting and rigging plan shall be required for, but not be limited to, lifts utilizing Hoists and Overhead Cranes, and Mobile Cranes. The Contractor shall use FDF form FS-F-3943 for Hoists and Overhead Cranes and form FS-F-3944 for Mobile Cranes. The forms will be made available upon request.

Critical Lifting Plan -For determinations and requirements, refer to Chapter 15 of the FDF Hoisting & Rigging Manual. Some lifts that are considered critical include: Multiple crane lifts, crane use at 80% or above the rated load chart capacity at any configuration, lifting over a building where occupied or where work is being done. FDF reserves the right to review and determine if any lift may be classified as critical.

B.6.2 Rigger Qualifications

FDF reserves the right to observe and/or interview riggers as the basis for approving or disapproving rigging qualifications. The Contractor shall submit a completed Level 1, 2, or 3 Rigger Verification Form at least two days prior to site access for FDF approval using forms FS-F-4706 (Level 1), FS-F-4707 (Level 2), and FS-F-4708 (Level 3). These forms will be made available to the Contractor at mobilization. The forms require that the Contractor verify qualifications and allow for verification by the union representative.

B.6.2.1 Level 1 Rigger

A Level 1 Rigger shall be approved to rig loads of #2000 lbs., which are not classified as critical, when using an approved FDF lifting plan in accordance with Chapter 15 of the FDF Hoisting and Rigging Manual.

A lifting plan shall be signed by either a Level 2 or Level 3 Rigger and submitted to FDF for approval. All rigging conducting by a Level 1 Rigger shall be visually checked prior to lifting

by a Level 2 Rigger, a Level 3 Rigger.
The Level 1 Rigger shall have a minimum of 16 hours of rigging training, meeting the following requirements:

Basic rigging terminology;
Proper use of various types of slings and rigging tackle;
Storage requirements for rigging equipment and tackle;
Daily inspection techniques for various types of rigging equipment; and
Safe attachment of slings for straight lifts, basket, hitches, choker hitches, and multiple-leg bridge assemblies.

B.6.2.2 Level 2 Rigger

A Level 2 Rigger will be approved to rig all loads except for critical lifts.

A Level 2 Rigger shall have a minimum of 40 hours of rigging training , meeting the following requirements of FDF:

Level 1 Rigger requirements;
Reading lift plans and rigging drawings;
Determining change in safe working load capacity of slings as the configuration or angular stresses change;
Determining the weight and center of gravity of an object to be hoisted; and
Testing and inspection of rigging equipment in accordance with recognized industry standards.

A Level 2 Rigger shall have a minimum of 2000 hours of verifiable experience from the Contractor and/or the Union Hall. Verifiable experience is defined as, working on a project which required as part of the persons work scope, hands on rigging. (i.e., Former employer names and phone numbers, project type, and or Union hall records.

B.6.2.3 Level 3 Rigger

A Level 3 Rigger is required for all lifts classified as critical. The level 3 Rigger designated by the Contractor to be responsible for a critical lift is the Person In Charge (P.C.).

A Level 3 Rigger shall have a minimum of 120 hours of rigging training, meeting the following requirements of FDF.

Level 2 Rigger requirements;
Jacking and rolling;
Inclined-plane movement of loads;
Rigging design;
Snatch block and winch system;
Lifting angles and compound loading;
Load control requirements;
Multiple-hitch systems; and

Heavy rigging.

A Level 3 Rigger shall have had three years of verified experience under the direct supervision of a qualified Level 3 Rigger. Verifiable experience is defined as, working on a project which required hands on rigging as part of the person's work scope,. (i.e., Former employer names and phone numbers, project type, and or Union hall records).

B.6.3 Inspection

Prior to site use, mobile cranes/boom trucks shall be inspected by FDF. No equipment will be permitted to start work until inspected by FDF crane inspector and documentation of required annual inspection and of maintenance records are presented to FDF by the Contractor.

Copies of annual inspection documentation shall be presented to FDF 24 hours prior to delivery of any mobile cranes/boom trucks.

The Contractor shall maintain a record of daily inspections of mobile /boom trucks. This record shall include documentation of the inspection in the equipment log .

Daily and Monthly inspection records shall be maintained at the Contractor's field office and shall be readily available for review by FDF.

The Contractor may choose to utilize FDF form FS-F-3947, FDF Mobile Crane Operator Checklist to document inspections, the form will be made available upon request.

FDF will periodically check the inspection reports that will be kept on file by the Contractor as outlined in this section.

The monthly inspection of mobile cranes shall be documented by the operator or other designated personnel. The Contractor may choose to utilize FDF form FS-F-3948, "FDF Wire Rope & Hook Condition", to document inspections. This form will be made available upon request.

The Contractor shall record daily inspections of hoists. Any deficiencies found during the daily inspections shall be noted on the check list. If a deficient condition, noted during the hoist daily inspections, constitutes a safety hazard and if the unit requires more detailed inspection prior to use, the crane will be taken out of service until the deficiency is corrected. The Contractor may choose to utilize FDF form FS-F-2423, "FDF Record of Daily Hoist Check". This form will be made available upon request.

B.6.4 Lifting Personnel

If it is determined that there is no practical, alternative way to lift a person other than by crane or forklift, the Contractor shall identify such in his work plan. FDF shall review and approve the Contractor's decision prior to the lift being executed.

B.6.5 Log Book

The Contractor shall keep a log book in the crane to record lifts that are made during daily activities. The log books are to be filled out by the crane operator.

Log entries shall include:

Name of Operator;
Name of Rigger;
Date of lift;
Hours on the crane meter at start of crane operation;
Location of lift;
Description of load;
Rigging and configuration used; and
If critical lift, list the PIC.

When a crane is equipped with a computer system, such as a Load Movement Indicator (LMI), the computer shall not be shut off nor the override engaged. All warning lights and alarms must be operational.

B.6.6 Overhead Electrical Condition

Overhead conductors shall be considered energized. 48 hours before the commencement of operation near electrical conductors, the Contractor shall notify FDF. FDF will arrange for the system to be de-energized and lockout/tagout of the lines shall be in accordance with OP-0004, FDF's Lockout/Tagout (Hazardous Energy and Material Control Procedure).

B.6.7 Rigging, Hooks, Lift Plans

Only hooks with latches to bridge the throat opening shall be used.

All slings used at the FEMP shall have a certificate of proof test to 200% of vertical working load limit (WLL) and have a manufacturers tag with the following minimum information:

Manufacture's name;
Wire rope construction; and
Vertical working load limit

Below-the-hook lifting devices fabricated for use on site shall be fabricated per engineering documents that have been reviewed and approved by a Registered Professional Engineer (RPE) licensed in the State of Ohio.

The Contractor shall perform periodic inspections of structural and mechanical below-the-hook lifting devices. FDF form FS-F-2478, "FDF Lifting Devices, Grabs, & Tongs Checklist". This form will be made available upon request.

All below-the-hook lifting devices purchased or rented for use at FDF shall be supplied with

a manufacturer's certificate of testing.

B.6.8 Rigging From Forklifts

If it is required to use rigging equipment (e.g., wire rope slings, synthetic slings) to lift with the forks of the forklift, the following requirements must be followed:

Lifting with only one fork shall not occur without an engineering analysis by a registered PE and approval by FDF;

The capacity of the forklift shall be reduced in relation to the location of the load on the forks per the charts in the forklift;

The slings shall be protected from any sharp bends over the forks;

The slings shall be sized for the load that will be lifted;

Clamps shall be used to ensure that the sling will not slide off the end of the forks; and

The manufacturer's recommendations shall not be exceeded.

If a lift is classified as critical, a PIC shall be appointed and a Critical Lift Plan prepared and processed by the Contractor and approved by FDF.

B.7.0 Tools - Hand and Power

B.7.1 Inspection of Tools and Equipment Prior to Site Access

The Contractor shall notify FDF Construction Manager at least two working days prior to bringing tools and equipment including fuel storage tanks (See Special Conditions - Notification of Fuel Storage Tanks) on site.

When OSHA requires equipment inspection by a competent person, the certification of inspection must accompany the equipment.

Equipment and tools will be subject to inspection by FDF upon arrival at the site. Inspection shall include but not be limited to the following: OSHA compliance, damage that could render the item inoperable, and oil, hydraulic or other fluid leaks. Tools or equipment may be radiologically checked if there is a possibility they were used on other radiologically contaminated sites.

Power tools shall have guards and other apparatus in accordance with the manufacturer's data. The Contractor shall be prepared to supply this data in case of questions arising during the inspection.

B.7.2 Power Tools

Defective tools shall be immediately tagged "DO NOT USE" and removed from the Jobsite by the end of the shift.

All power tool inspections shall be documented by the Contractor.

B.7.3 Powder Activated Tools

The Contractor shall submit a written request to use powder activated tools to FDF prior to use. FDF reserves the right to disapprove usage at the FEMP.

B.7.4 Power Wash Equipment

All power spray/wash units shall have the factory approved operator/safety manual for use by the operators of the equipment. This manual shall either be with the equipment at the time of use or be on file, available for reference when requested. The safety requirements within the manual shall be followed. The requirements of the Water Jet Technology Association shall be followed as a minimum. Only personnel with documented training shall be permitted to operate such equipment.

B.7.5 Water Supply Hoses

All hoses shall be routed away from traffic areas or protected from accidental damage. All hoses shall be pressure rated & tested as required for use.

B.7.6 Generators

The Contractor shall inspect all generators daily before use. The generator shall provide effective over current protection for all devices or equipment it supplies. Refueling shall only occur after the engine has been turned off and cooled down. The owners manual/safety manual shall be available for review upon request.

B.8.0 Burning, Welding and Open Flame Work

FDF requirements in addition to OSHA are:

Open Flame and Welding Permits are required for open flames, flame cutting, welding, grinding, brazing and other forms of hot work. A completed FEMP Flame and Welding Permit is required for each shift. (Part 8 Section B 2.6, FDF Permits).

A continuous fire watch shall be required during and for a period of, at least, 30 minutes after completion of any cutting, welding or burning operation.

Personnel performing flame cutting, welding and burning including helpers when assisting and fire watch personnel shall wear fire retardant nomex coveralls furnished by FDF. Additionally, leathers or similar protection shall be used any time that hot debris is likely to contact clothing. Fire retardant clothing shall not be considered protection from burning

slag or other hot debris.

Combustible materials and equipment that cannot be moved, building surfaces and openings in ducts, tanks or other confined spaces within 20 feet or below the work must be covered with fire resistant welding blankets.

Flame cutting or welding on small tanks, piping or containers, which cannot be entered, require cleaning, purging and atmospheric testing before starting work.

The Contractor shall discuss in his safe work plan how he will perform work on piping and tanks used for combustible liquids or gases and require intermittent testing during the work.

Oxygen-fuel gas systems shall be equipped with listed and approved back flow valves, and pressure-relief devices.

B.9.0 Electrical

B.9.1 Ground Fault Circuit Interrupters

Ground Fault Circuit Interrupters (GFCI's) shall be furnished by the Contractor on all 120 volt circuits at all construction sites. The GFCI shall be placed at the source of the electrical service to protect both the cord and the devices connected. Assured grounding programs are not acceptable for 120 volt circuits.

When commercially available, GFCI's shall also be used on other voltages for field use equipment/tools. If the GFCI is not available, an assured grounding program shall be required for all cords and equipment. This program shall be included into the Safe Work Plan.

B.9.2 Flexible Cord Sets

Use of flexible cord sets with repairs to the cord is not permitted. Cord sets are to be routed overhead where possible to avoid damage. All flexible cords shall be UL listed and rated for hard usage and damp locations. Only purchased cord assemblies will be permitted for 120 volt service.

B.10.0 Motor Vehicles, Earth Moving Equipment and Mechanized Equipment

B.10.1 Program Requirements

As a section of the Final Safe Work Plan, the Contractor shall submit a Heavy Equipment Operation, Inspection and Maintenance Program which includes the following items:

- See Attachment 11 for minimum program elements
- Heavy equipment shall not be left unattended until:

- the engine is off
- controls are in a neutral position
- equipment is at "zero energy" condition
- brakes and/or wheel chocks are in place

- Equipment & engine maintenance plan, including a daily, weekly, monthly and annual requirements. This plan needs to define the method to accomplish the scheduled maintenance and how the waste materials (including used oil and filters) will be handled and disposed.

  - If a Contractor's vehicle is being sent off site, collection of the oil (for disposal by FDF) is not required if potential internal contamination of the engine is not suspected as indicated by the surveys of the vehicle air filter(s) (performed during the vehicle unrestricted release survey). If there is indication of potential internal contamination of the engine, further radiological surveys and decontamination (as necessary) will be required until radiological levels meet requirements for Contractor's vehicle unrestricted release.

  - If Contractor's vehicles that have worked in the OSDF Contamination Area are released (satisfactory completion of vehicle unrestricted release survey) from the Contamination Area to an on site Uncontrolled Area to change the oil, the oil collected may be taken off site for disposal by the OSDF project subcontractor. Radiological Control personnel will be notified prior to this maintenance activity and will survey the oil collection container prior to use in this situation.

  - If it is necessary to change Contractor's vehicle oil within a Contamination Area, the OSDF project will coordinate with the on site garage personnel for disposal of used oil. Coordination of this activity with radiological control personnel is required to prevent the introduction of radiological contaminants into the engine internals. This is not the preferred option when changing oil.

- Heavy machinery, equipment, or parts thereof, which are suspended or held aloft by use of slings, hoists, or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. Bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment, shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the motors stopped and brakes set, unless work being performed requires otherwise.

- Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines shall have the wheels chocked and the parking brake set.

- All cab glass shall be safety glass, or equivalent, without cracks or breakage, that introduces no visible distortion affecting the safe operation of any machine.

- All material handling equipment and mobile powered personnel lifts shall have the

factory approved operator/safety manual for use by the operator and personnel. This manual shall either be with the equipment at the time of use or be on file, available for reference when requested. The safety requirements within the manual shall be followed.

B.10.2 Equipment Operator

Before an operator uses equipment on site, the Contractor shall furnish FDF with a signed copy of the Operator Verification Form (**EXHIBIT "12"**) for the type of equipment to be operated, at least five working days before starting work. Acceptable verifications can be from the equipment manufacturer, a certified trainer, the Operating Engineers Union or the employer.

Before beginning work on site, the operator shall become familiar with the specific equipment to be operated by reviewing the manufacturer's operating manual and by physically operating the equipment. The Contractor shall document this familiarization and retain a copy in the jobsite files.

Operators shall be briefed on traffic flow plans, hazard areas, and dust control plans before being permitted to operate equipment.

Operators of hoisting equipment shall maintain a daily log, in the equipment, of all lifts as described in the FEMP supplement to the DOE Hoisting and Rigging Manual Chapter 11. Fluor Daniel Fernald will provide the log books. Log books are to be submitted to Construction Document Control at the completion of this subcontract or when equipment leaves the FEMP, whichever occurs first.

B.10.3 Back-up Alarms

All self-propelled construction equipment and site vehicles shall be equipped with an automatic electronic audible reverse signal alarm. See Exhibit 11.

B.10.4 Seat Belts

Seat belts are required for all vehicle (including gas or electric powered carts) occupants. Occupants are required to use seat belts when vehicles are in operation.
See Attachment 11.

B.11.0 Trenching and Excavations

Soil must be assumed to be Type "C" as defined by 29 CFR 1926 Subpart P, unless classified by a competent person. Soil within the site fenced area shall be assumed to be disturbed.

Requirements of the Confined Space Program (Part 8, Section B.12.0) apply to excavations four feet or more in depth.

The Contractor shall perform an Excavation Entry and Daily Inspection prior to entering an excavation. The current inspection shall be maintained at the job site for reference and review by the workers. The Contractor shall document the inspection and maintain a file

onsite for review by FDF. The Contractor will use FDF form FS-F-4442 for excavation inspections and form FS-F-4378, "Competent Person's Daily Field Inspection Report." These forms will be made available upon request. At the end of the project, all inspection forms shall be submitted to FDF.

Competent person shall determine protection systems for excavations up to 20 feet deep to protect employees from cave-ins. Excavations 20 feet deep or more shall be designed by a Registered Professional Engineer licensed in the State of Ohio.

The Contractor shall maintain a physical barrier (minimum orange snow fence) at the perimeter of all utility excavations, trenches or other open excavations as long as they are open. Any barrier fencing shall be supported by "T" posts as a minimum requirement. The use of rebar is not permitted.

Hand digging, as opposed to mechanical excavation, shall be conducted within three feet of underground functional utilities or when required by FDF. Hand digging shall be defined as either manual removal of the soil or hand probing the area prior to mechanical excavation as approved by the Construction Manager. The maximum amount of soil allowed to be removed between probing excavation is three inches.

For the purpose of this project, excavations of less than 10 inches will normally not be considered to be applicable to the OSHA requirements, unless the Competent Person determines that a hazard (exposure) is present. Thus the below requirements will not apply to excavations of less than 10 inches.

Complete initial inspection by completing the blocks on the form used and drawing a line through the blocks on the form not used for this classification testing.

Perform soil classification as defined in 29 CFR 1926, Subpart P, Appendix A. A minimum of one Visual and one Manual classification test is required to determine soil type. The manual test shall be done with a penetrometer or shearvane. Notification of initial testing shall be made to FDF Safety to allow oversight of testing methods.

Inspect the excavation and protection systems using Competent Persons Daily Field Inspection Report.

a) Daily, prior to work beginning and as conditions change.

b) After every measurable rain or other hazard increasing occurrence (e.g., freezing and thawing conditions).

c) After any other event that may affect stability of the excavation or protective system.

B.12.0 Confined Space Program

A list of existing permit-required confined spaces which are located in the project work area is provided in EXHIBIT "7".

It is the Contractor's responsibility to ensure their employees and all Subcontractor employees are informed of the presence of permit-required confined spaces in the project area.

Any time Contractor personnel or Subcontractor employees are required to enter permit-required confined spaces at the FEMP, the Contractor shall observe the requirements of FDF's Permit Required Confined Space Program. FDF's confined space program complies with the requirements of OSHA 29 CFR 1910.146. Prior to any entry into a confined space at the FEMP site, the Contractor shall ensure that the following criteria are satisfied:

All confined spaces at the FEMP are classified as permit-required confined spaces until evaluated by FDF;

Prior to making an entry or performing any work in a confined space, the confined space shall be evaluated by FDF;

When no hazards are present in the confined space, a Confined Space Evaluation Form will be completed by FDF stating that the space is a non-permit confined space for the work activity and work may progress with minimal requirements;

If evaluation of the confined space indicates a hazard(s) is present in the space, the space will be classified as a permit-required confined space and a Confined Space Entry Permit will be issued by FDF;

If the contractor creates a confined space, they will be responsible for installing the proper labeling/signage.

Prior to any entry into a permit required confined space, efforts shall be made to remove the identified hazard(s) from the space. If the hazard(s) cannot be removed from the space, certain steps/criteria specified in 29 CFR 1910.146 are required (i.e., continuous/periodic monitoring of the atmosphere, attendant/standby personnel, entry supervisor, fall protection/retrieval equipment, confined space rescue plan, confined space training);

The FDF Emergency Response Team (ERT) will conduct confined space rescues; and

Contractor personnel required to enter into permit required confined spaces, to act as standby/attendant personnel, or to act as entry supervisors shall attend Confined Space Training offered by FDF or alternate confined space training which meets the training requirements of 1910.146. Documentation of training by alternate confined space training providers shall be submitted to FDF for compliance review.

B.13.0 Lock and Tag (Energy Control)

The Contractor shall comply with FDF Lock and Tag Procedure OP-0004 which meets the requirements of 29 CFR 1910.147. Salient features of this procedure are:

All personnel involved in energy control shall be trained by FDF;

Initial lockout/tagout shall be performed by FDF;
Independent verification is required for lock and tag;
The Contractor's appointed employee shall make a safe condition check of FDF's Lockout/Tagout;
Each Contractor appointed employee involved in the work activity shall install their own personal lock and tag at each lockout /tagout location;
At the beginning of each shift, each authorized employee shall make a physical walk down to verify that lockout/tagout is still in place; and
An authorized employee is a qualified employee where work will require them to enter the path of hazardous entry or materials.

B.14.0 Buddy System

The "buddy system" (as defined in OSHA 29 CFR 1910.120(a)) shall be required for all work except when a hazard evaluation has been completed and approved by FDF OS&H. Any work in remote areas shall required an effective means to receive and send emergency information/ communications .

B.15.0 Heat and Cold Stress Requirements

B.15.1 Heat Stress

The Contractor's heat and cold stress program shall meet or exceed provisions of the (ACGIH TLV booklet. The Contractor shall submit a detailed program including monitoring procedures and methods of control. In lieu of developing a Heat Stress Program, the Contractor may choose to use FDF's Heat Stress Program. If the Contractor chooses to use FDF's program the Contractor shall submit a statement that the Contractor will comply with FDF's program.

The Contractor shall conduct physiological monitoring in accordance with EXHIBIT "8", Requirements for Physiological Monitoring. When physiological monitoring is conducted a dedicated person is required to track exposure.

FDF will provide the Contractor's personnel with training in physiological monitoring. The Contractor shall supply the equipment required to conduct physiological monitoring. The Contractor shall notify the FDF Construction Contracts Manager at least 5 working days in advance of training for scheduling with FDF Medical. Training will be performed in the work area and last about two hours.

The Contractor may use the following methods in conjunction with the required methods:

The Contractor may conduct physically demanding work during off shifts when protective clothing is required during June, July and August;

Personal protective equipment (ice vest). Contractor must provide freezer and vests; and

Develop cool down and/or heat stress rooms. These are areas inside of the work area that are environmentally controlled. The Contractor is responsible for room construction

including air conditioning units. Requirements for entry to cool room and heat stress control rooms are given in Part C.2.10.

The Contractor shall have a log in/log out system during periods when work/rest schedules are used.

B.15.2 Cold Stress

The Contractor can use the tables found in the latest edition of the ACGIH TLV booklet, "Working in Cold Temperatures", for cold stress compliance or submit a program for compliance review.

The Contractor shall have a log in/log out system during periods when work/rest schedules are used.

B.16.0 Substance Abuse Requirements

The Contractor shall submit a Substance Abuse Program in compliance with FDF's General Provision clauses titled, "Workplace Substance Abuse Program at DOE sites," and "FDF Substance Abuse Program." The Contractor's Substance Abuse Program shall include, at a minimum, the elements shown in Part 8, EXHIBIT "9", "Model Substance Abuse Program."

EXHIBIT "9" may be completed, signed, accepted for use and submitted by the Contractor or the Contractor may submit another Substance Abuse Program meeting the requirements.

As a condition for work under this Contract, Contractor employees will be required to submit to drug and/or alcohol testing conducted by FDF.

Initial screening negative test results are reported to FDF within 48 hours following Collection of test. Confirmation of positive tests including evaluation by FDF's Medical Review Officer requires up to 96 hours following testing. Holidays and weekends are not included in these durations.

Any employee whose FDF ID badge has been terminated for less than sixty (60) calendar days or who has been absent from site for less than sixty (60) calendar days does not require re-testing for access. All other Contractor employees shall be tested prior to access.

Contractor employees cannot perform work under the Contract before receipt of negative drug and/or alcohol test results. Training, required medical, and In-Vivo examinations can be performed pending test results. In the event that the employee is denied access to the site, the Contractor shall bear the cost of employee's time for training, etc.

Any employee testing positive for the use of illegal drugs, illegal use of prescription drugs, or alcohol in excess of FDF limits shall have their access to the FEMP site inactivated by the FDF Medical Review Officer

Minimum sanctions to be taken by the Contractor against employees who tests positively for

the use of illegal drugs or alcohol in excess of FDF limits shall include:

Inactivation of site access, for persons seeking initial access, for one year. After one year they would be required to pass access drug and/or alcohol testing and be approved by the FDF Medical Review Officer and provide documentation of completion of evaluation by a substance abuse professional; and

For first time positive random, suspicion, or occurrence test, inactivation of site access pending Employee Assistance Program (EAP) recommendation, negative substance abuse testing and approval by the FDF Medical Review Officer; and

The employee will be placed in a follow-up testing program of unannounced testing for a period of one to five years; and

For a second positive substance abuse test, site access shall be inactivated permanently.

For reasonable suspicion or occurrence testing, in the event that a laboratory confirmed negative is not received within 48 hours from the time that tests are taken, the Contractor employee will not be allowed to perform safety sensitive duties including but not limited to:

Operation of motor vehicles and hazardous moving equipment of machinery including cranes and fork-lifts;

Work at unprotected heights including ladders and scaffolds; and

The employee cannot perform safety sensitive work until notified by FDF of a negative test result. A positive test result may result in inactivation of site access as described above.

Sampling and laboratory costs of drug and alcohol testing shall be borne by FDF. Costs for employee time related to drug and alcohol testing including waiting periods for results and removal from safety sensitive work shall be borne by the Contractor.

Refer to the Project Labor Agreement 14-3 for related provisions.

Work on this Contract has been determined to be "testing designated". Contractor employees are subject to random testing.

Requirements for drug testing do not apply to visitors who are not performing work in safety sensitive functions. A visitor, for purposes of this program, is anyone requiring access to the FEMP for a period of 14 calendar days or less.

See EXHIBIT "9" for additional information on the substance abuse program.

B.17.0 Signs

The Contractor shall supply and post appropriate signs stating "Construction Area - Authorized Personnel Only". Signs shall be placed approximately every 150 feet around the

defined construction area and at all entrance points/gates. See the sign detail in Exhibit "15".

C. RADIOLOGICAL REQUIREMENTS

C.1.0 Purpose

FDF and it's Contractors are required to comply with the requirements of DOE Order 5400.5 Radiological Protection of the Public and Environment ,10 CFR 835 Occupational Radiation Protection, FDF's Radiological Protection Program, and FDF RM-0020 Site Specific Radiological Control Requirements Manual. The following requirements were derived from these documents.

This section provides the Contractor with many of the radiological requirements by which to plan the project. Additional radiological control requirements are incorporated throughout the body of this Contract. Specific information contained in this section includes: anticipated FDF Radiological Control interface with the Contractor; general radiological considerations; personnel entry and exit protocol through radiological areas; radiological limits; access and monitoring requirements, Radiological Work Permits (RWPs), and personal protective equipment (PPE).

C.2.0 Project Radiological Requirements Plan

C.2.1 Radiological Control Interface with the Contractor

C.2.1.1 FDF-Provided Radiological Control Programs

FDF will provide radiological control support, including providing Radiological Control Technicians (RCTs), radiological monitoring, and record keeping. The Contractor shall comply with all radiological control requirements, directions, RWPs, Safe Work Plans, training requirements, sampling, testing, oversight, etc. As part of this FDF will provide the following:

DOELAP accredited external dosimetry program (including record keeping and reporting);
All radiological monitoring equipment;
Internal Dosimetry program (including air sampling, bioassay, In Vivo analysis, and record keeping);
Radiological Worker Training program consistent with the requirements of 10 CFR 835 and the DOE Radiological Control Manual; and
Radiological Control support personnel trained to the requirements of 10 CFR 835 and the DOE Radiological Control Manual.

C.2.1.2 Daily Activities List

The Contractor is required to provide FDF with a Daily Activities List describing projected activities (including movement of material and specific personnel activities), crew sizes, crew members, and crew locations. This information shall be provided at least 24 hours prior to commencement of work.

C.2.1.3 Walk Downs/Meetings

Representatives of FDF will participate in periodic walkdowns/inspections , be present at pre-job meetings to address health and safety requirements of the safe work plans or work permits, will attend weekly meetings with the Contractor to raise issues of concern, provide updates on the status of the quality of radiological controls for the project activities, participate in morning safety meetings with the Contractor's personnel, and discuss radiological safety requirements pertaining to work practices previously witnessed and anticipated based on upcoming work.

C.2.1.4 Radiological Sources

Radiological sources may only be brought onsite with prior approval of FDF. Required information from the Contractor includes the type and activity of the source, its intended purpose, how long the source is expected to remain onsite, and what controls will be placed on the source to ensure its stability while onsite.

C.2.1.5 Bioassay Cards

All personnel qualified under FDF Radiological Worker II Training are required to leave a bioassay (urine sample) after every sixty (60) calender day period and at the end of work on the Contract. Bioassay cards will be provided to the prime Contractor for distribution to all affected employees. Employees who will be leaving the job prior to the next sampling date are required to leave a sample just before final departure.

The Contractor shall submit a list of his employees names and badge numbers requiring urinalysis sampling to FDF by 10:00 a.m. on the fifteenth (or closest working day) of each month for the preceding work period. This form shall be completed for the Contractor and its Subcontractors. Required information shall be reported for all workers qualified under FDF Radiological Worker II Training that have worked at the Project site during the reporting period.
All workers receiving a bioassay card will be required to report to the bioassay station in the S&H Building (Bldg. 53) by the date shown on the card. Failure to report to the bioassay station within the required time period may result in the employee being denied access to the Controlled Area until the requirement is fulfilled.

It is the Contractor's responsibility to confirm that it has received bioassay cards for all affected employees. Missing cards must be reported immediately to FDF.

C.2.1.6 Radiological Incidents and Reporting for All Project Work

C.2.1.6.1 Reporting and Classification

NOTE: In an emergency situation, the health and safety of an employee takes precedence over radiological controls.

All radiological incidents or abnormal events shall be immediately reported to FDF. Examples

include, but are not limited to, skin or clothing (non-PPE) contamination, situations where radioactive material uptake is suspected and situations where contamination is spread to a Controlled Area or clean area.

The Contractors supervisor shall document the event or condition in writing. This documentation should include enough information to reconstruct the event, its associated consequences, corrective and recovery actions, and the estimated dollar amounts of damage to property or cost of the corrective actions taken; and

If an event critique is required, the Contractor is responsible for ensuring that all applicable employees attend the critique.

C.2.1.6.2 Radiological Deficiency Reports

Radiological Deficiency Reports (RDRs) are written by FDF to document radiological deficiencies. Examples include, but are not limited to, poor performance of health physics practices, violations of procedures and safety policies, personnel contaminations, etc.

The Contractor is responsible for correcting deficiencies and providing a written response summarizing action(s) taken and/or planned to prevent recurrence.

C.2.1.7 Stop Work Authority

All FDF and Contractor personnel have the responsibility and authority to stop radiological work when radiological controls are inadequate.

In any situation in which stop work authority is used, the following requirements apply:

Exercise stop work authority in a justifiable and responsible manner;

Once work is stopped, do NOT resume until proper radiological controls have been established; and

Resumption of work requires approval of FDF Radiological Control Manager.

C.2.2 General Radiological Considerations

C.2.2.1 Radiological Isotopes of Concern

The most limiting isotope (for radiological contamination control purposes) is determined and applied as the isotope of concern. This is determined by FDF based on a combination of sampling data, calculation and process knowledge.

See Part 6 for descriptions of the work areas covered by this Contract and their respective isotopes-of-concern. Surface contamination and airborne radioactivity limits will vary based on the isotopes of concern. Frisking techniques and whole body monitoring techniques will

necessarily vary in these areas as well.

C.2.2.2 ALARA Considerations and Exposure Limits

ALARA is an approach to radiological control to manage and control exposures (individual and collective) to the work force and to the general public at levels As Low As Reasonably Achievable, taking into account social, technical, economic, practical and public policy considerations. ALARA is not a dose limit but a process that has the objective of attaining doses as far below the applicable controlling limits as is reasonably achievable.

The Contractor shall perform necessary actions to maintain occupational exposures below site administrative limits (internal and external exposures) and shall practice ALARA at all times.

The Contractor shall take measures to maintain radiation exposures in controlled areas As Low As Reasonably Achievable through facility and equipment design and administrative control. The primary method used shall be physical design features (e.g., confinement, ventilation, remote handling, and shielding). Administrative controls and procedural requirements shall be employed only as supplemental methods to control radiation exposure.

For specific activities where use of physical design features are demonstrated to be impractical, administrative controls and procedural requirements shall be used to maintain exposures ALARA.

ALARA practices shall be identified and documented in the Contractor's safe work plan(s).

C.2.3 Radiological Controls, Limits and Requirements

C.2.3.1 Personnel Monitoring Limits

When personnel are surveyed upon leaving a Contamination or Controlled Area the fixed plus removable limit for uranium (listed in Table 1) shall be applied.

If a personnel monitoring instrument alarms then the worker must notify FDF. FDF will investigate to determine if there is long-lived contamination (e.g., uranium) on the worker's clothes or skin. If this is confirmed, FDF will begin the documentation of the incident and decontamination of the worker.

C.2.3.2 Airborne Radioactivity Control Requirements and Limits

Within the work area, airborne radioactivity shall be controlled to levels less than 10% of the specific derived air concentration (DAC) taking into account the protection factor (PF) of the respirator worn by workers in the area and ALARA. The PFs applicable to respirators that may be used on this project are:

PF = 1000 for powered air-purifying respirator;
PF = 50 for full-face air-purifying respirator; and

PF = 1 for no respirator .

NOTE: If the Contractor desires the use of other types of respirators on the job beyond those listed, the Contractor shall contact FDF to determine the respiratory protection factor of that respirator.

If general area airborne radioactivity exceeds 10% of the appropriate DAC (given the appropriate respiratory protection factor), then immediate radiological controls must be implemented at the source of generation to reduce airborne concentration. Upon written notification by FDF, the Contractor has one week to provide FDF with a written explanation of causes and corrective actions to prevent the recurrence of the situation.

In all cases, the Contractor shall control airborne emissions at the project boundaries such that 2% of the DAC is not exceeded (based on a weekly average).

C.2.3.3 Contamination Control Requirements and Limits

Areas requiring radiological posting that exceed the contamination limits listed in Table 1 (below) require additional PPE (e.g., contamination clothing) to perform work in that area.

Down posting Soil Contamination, Controlled, Contamination, or High Contamination Areas from radiological occupational exposure control concerns requires reducing contamination levels in work locations below the radiological limits requiring posting and ALARA. Down posting of these areas is also performed through the site certification process (certifying that Final Remediation Level (FRL) in the remediation area has been attained).

C.2.3.4 Radiation Control Requirements and Limits

FDF Radiological Dosimetry performs investigations of unplanned external exposure results when the following levels are exceeded:

100 mrem to the whole body; and
1,000 mrem to the skin or extremities.

NOTE: If any of these levels are exceeded, the Contractor shall be required to participate in an investigation into the cause of the exposure.

FDF Dosimetry performs internal dosimetry investigations with possible follow-up bioassay sampling when one of three conditions listed below occur:

1. Air sampling indicates that a worker(s) may have been exposed to levels above the action level for a particular radionuclide.

NOTE: Action levels are determined by internal dosimetry on a nuclide specific basis. Action levels are typically based on a worker's potential to receive two mrem Committed Effective Dose Equivalent (CEDE) in a one week period.

2. An incident or routine bioassay sample (urine and/or fecal) result is above the decision level for a particular radionuclide.

3. A routine or incident In Vivo measurement (i.e., lung) is above the decision level for a particular radionuclide.

When an internal dosimetry investigation is required, actions taken by internal dosimetry are as follows:

A preliminary internal dose estimate is performed based on air sampling and/or bioassay results;

An interview is performed with the worker and/or their supervisor to determine radiological working conditions and potential time of intake;

If preliminary dose estimates are greater than or equal to 100 mrem CEDE, a radiological work restriction is issued and a field investigation is initiated;

NOTE: A radiological work restriction may be issued by Dosimetry with approval of the Radiological Control Manager when preliminary dose estimates are less than 100 mrem to limit any further exposure that may prevent obtaining valid follow-up bioassay sampling and interfere with the dose evaluation.

Obtain follow-up bioassay sampling (In Vitro and/or In Vivo) to confirm initial results; and

NOTE: The type and extent of follow-up bioassay sampling required is determined by internal dosimetry given the type of exposure, the radionuclide, the length of time since the exposure, and the preliminary dose estimate. For incident investigations, involving potential exposure to uranium, a minimum of two samples is required.

Finalize internal dose estimates and notify worker or supervisor after follow-up sampling is completed.

Workers shall be restricted from working in Controlled and Radiological Areas if total (external plus internal) exposures, in any one calendar year, exceed 1,000 mrem Total Effective Dose Equivalent (TEDE). The following conditions also apply:

The worker restriction shall last until the end of the calendar year in which the exposure was received; and
investigation shall be initiated by FDF when a worker reaches 80% of this limit. The investigation will determine whether the worker requires limitations on work in a Radiological Area to ensure that the annual limit (1,000 mrem TEDE) is not exceeded.

C.2.3.5 Radiological Postings

C.2.3.5.1 Airborne Radioactivitiy Areas

Airborne Radioactivity Areas will be posted around locations that exceed (or have the potential to exceed) a weekly average of 10% of the (DAC) limits for uranium. Engineering and/or administrative controls shall be implemented for these areas to control the impact on personnel and other project areas.

C.2.3.5.2 Soil Contamination Areas

Any area where radioactive material contamination exists in a matrix (e.g., soil) at levels exceeding natural background and has not been released for unrestricted use in accordance with DOE Order 5400.5 Radiation Protection of the Public and the Environment (DOE, 1990) will be posted as a Soil Contamination Area.

The FEMP site is posted as a Soil Contamination Area. Radiological requirements for Soil Contamination Areas apply to all project areas with the exception of areas that have been certified to meet FRLs (OSDF cell liner construction will occur in an area that is "certified" and, upon commencement of impacted material placement, will be up-posted to a Soil Contamination Area or a Contamination Area).

C.2.3.5.3 Controlled Areas

Areas that are managed in order to protect individuals from exposure to radiation and/or radioactive materials will be posted as Controlled Areas. Individuals who enter only the Controlled Area without entering Radiological Areas are not expected to receive a total effective dose equivalent of more than 100 mrem in a year from sources other than radon or thoron and their progeny. Individuals who enter only the Controlled Area without entering Radiological Areas are not expected to receive a committed effective dose equivalent of more than 500 mrem in a year from exposure to radon or thoron and their progeny. The categories of Controlled Areas are:

Category I (Controlled Area): In addition to the definition above, Category I Controlled Areas are considered to have a potential for individuals to be exposed to low levels of radioactive contamination (below values listed in Table 1 below) when working in the area. Eating, drinking, smoking, and/or chewing is prohibited in a Category I Controlled Area unless approved by FDF. Personnel and material monitoring is required to exit a Category I Controlled Area.

The Material Transfer Area is located within a Category I Controlled Area, including the path up to the Impacted Material Haul Road (intersects with a Contamination Area) and the path from the OSDF Decontamination Facility (interfaces with a Contamination Area and a Soil Contamination Area. Radiological requirements for Category I Controlled Areas apply to this area.

Category II (Controlled Area): A Category II Controlled Area is an area that has been surveyed and released from contamination controls. No personnel or material monitoring is required to exit.

C.2.3.5.4 Contamination Areas

Any area where removable contamination levels are greater than the removable values listed in Table 1 (below) but less than or equal to 100 times those values will be posted as a Contamination Area.

The SWU, Impacted Material Haul Road, and OSDF cell(s) receiving impacted material from a Contamination Area will be posted as a Contamination Area. Radiological requirements for Contamination Areas apply to these project areas.

C.2.3.5.5 High Contamination Areas

Any area where removable contamination levels are greater than 100 times the removable values listed in Table 1 (below) will be posted as a High Contamination Area.

C.2.3.5.6 Radiation Areas

Radiation Areas will be established for any area accessible to individuals in which radiation level could result in an individual receiving a deep dose equivalent in excess of 5.0 mrem in one hour at 30 cm from the source or from any surface that the radiation penetrates.

C.2.3.5.7 High Radiation Areas

High radiation areas will be established for any area accessible to individuals in which radiation level could result in an individual receiving a deep dose equivalent in excess of 100 mrem in one hour at 30 cm from the source or from any surface that the radiation penetrates.

C.2.4 Personnel Entry and Exit Protocol Through Controlled Areas and Radiological Areas

C.2.4.1 Access to the Controlled Area

The workers must obtain their thermoluminescent dosimeter (TLD) PRIOR to reaching the Controlled Area. TLDs must be worn while the worker is in the Controlled Area and must be stored on the storage rack assigned to them when not in this area. TLDs shall be worn on the outside of the worker's clothing (non-PPE), facing forward, between their waist and shoulders.

Badging-in at the Access Control Point:

At the control point (access way from the Soil Contamination Area to the Controlled Area), workers will bar code into the computer verifying their training and bioassay requirements are current. If the access control computer system is inoperable, training will be verified by visual inspection of the worker's qualification card; and

If a worker's training or bioassay is insufficient or out of date, access to the Controlled Area will be denied.

Accessing the OSDF Material Transfer Area (in the Controlled Area) for project support:

Personnel will enter the Controlled Area through the Controlled Area access/egress point. The drivers will also be required to have the training required for accessing Contamination Areas, to be verified by the control point facility FDF RCT.

The Material Transfer Area vehicle operator will be required to observe the same personnel and equipment controls and requirements as the Contamination Area equipment operators with enclosed cabs, when accessing the Contamination Area from the Material Transfer Area, with the exception of shoe covers. The requirements shall remain in place the entire time the Material Transfer Area driver is in the OSDF Contamination Area. The driver shall not leave the haul vehicle until it has been surveyed out of the Contamination Area into the Controlled Area.

Material Transfer Area vehicle operators that cannot observe the same enclosed cab requirements as the Contamination Area equipment operators will not be permitted to enter the Contamination Area with the reduced access requirements.

C.2.4.2 Access to the Contamination Area

In addition to the TLD requirements in C.2.4.1, the following are standard requirements for access to the Contamination Area:

Workers will sign the appropriate RWP for entry into the work area, collect prescribed respiratory protection (if required), enter their badge number and respirator serial number into the project control point computer logging system (or coordinate with the project RCT to manually document this access information), show evidence of being respirator fit to the control point RCT, go to the dressing area, and don the prescribed protective clothing;

All PPE required for access to the project Contamination Area will be staged in the locker room area and will not be permitted into the break room side of the trailer (with the exception of respiratory protection;

If a worker's training or bioassay is insufficient or out of date, their access to the Contamination Area will be denied;

When wearing protective clothing such that no skin is exposed (e.g., full contamination clothing and a respirator), the worker' s TLD must be worn underneath the protective clothing. When protective clothing requirements are such that skin is exposed (e.g., no respirator), the TLD must be worn on the outside of the contamination clothing;

Prior to entering the work area, workers must contact an RCT for assignment to a personal air sampler and testing of the airflow of powered air purifying respirators (if worn). The following conditions apply to wearers of personal air samplers:

1. A minimum of 25% of workers in each work group/crew (minimum of one worker) shall wear a belt mounted personal air sampler. All other workers in the work crew must be signed-in on the paperwork under which their crew-partner received their personal air sampler. Workers in the work crew shall work in the general proximity of the other workers such that the assigned personal air sampler is representative of the air being breathed by all parties in the work crew. Workers not assigned to a particular work crew (example: heavy equipment operators and truck drivers) will each wear a belt mounted personal air sampler;

If changing work areas or work scopes, the worker must be signed-in on the appropriate RWP and verify their level of PPE is in compliance with the RWP (no one may be signed into more than one RWP at any time). If the worker must change protective clothing prior to moving to a new job area, the worker must exit the Contamination Area and go through the appropriate steps for re-entry, wearing the correct protective clothing. The worker will be reassigned to a different personal air sampler; and

Entry into the OSDF and SWU enclosed cab equipment parking/staging area (within the Contamination Area):

Contamination Area reduced requirements are only applicable to the equipment and the associated drivers meeting the requirements listed in this contract (including necessary parking/staging area controls and vehicle cab requirements) are as follows:

1. After performing the requirements for entry into a Contamination Area, the impacted material haul vehicle drivers will don the necessary PPE for entering the Contamination Area to access the haul vehicles (latex rubber shoe covers and nitrile gloves (cotton liners optional) only). Drivers will proceed directly to the parking/staging area and enter their vehicles.

C.2.4.3 Exiting the Contamination Area

C.2.4.3.1 PPE Limitations Requiring Personnel to Exit Contamination Area.

Workers must always leave the work area and doff contamination clothing at the appropriate control point whenever their protective clothing is compromised or when, non-water resistant anti-c's get wet or workers sweat through their protective clothing. FDF will periodically monitor contamination levels on outside of PPE. If contamination, as detected in surveys performed by an RCT, on the outside of a worker's work gloves is found to be greater than 1,000 counts per minute, the worker must change their work gloves. If this level of contamination is found on the outside of a single-layer of contamination clothing, workers must return to the control point to change their protective clothing.

The Contractor should estimate that a minimum of four workers per day will be sent through this routine. If 10% of the Contractor work force is greater than four workers, estimate that 10% of the workers will be sent through this routine daily.

C.2.4.3.2 Asbestos Area Requirements Within a Contamination Area.

Workers in Asbestos Areas that are in Contamination Areas will always be in a double layer of clothing. Prior to leaving areas requiring multiple layers of anti-c's due to differing types of contaminants or contaminant levels, workers will doff their outer set of anti-c's at the work area boundary and proceed directly to the appropriate change out facility. Doffing of the inner layer of anti-c's and personnel monitoring will be performed at the change facility.

C.2.4.3.3 General Exit Requirements

For breaks, end of shift, or other non emergency exits, workers leaving the Contamination Area will proceed to the appropriate control point to doff anti-Cs using the posted doffing protocol with the exception of Impacted Material Haul Road vehicle operators and adhere to the following requirements:

Personal items may be surveyed out by the workers themselves using friskers provided at the control point.

Tools, lapel samplers, and equipment may only be surveyed out of a Contamination Area by an RCT. Workers requiring items of this nature to be removed from the Contamination Area must give the RCT notice of such a need at least one full work shift in advance.

Whole body personnel monitoring is required prior to exit from the Contamination Area into the locker room area.

Workers will sign out on the RWP.

After successful completion of personnel monitoring, and exiting into an area not requiring TLD's, the workers shall then place their TLD in the appropriate slot of the TLD storage rack (slots are labeled with badge numbers).

Badging-out at the Access Control Point:

1. At the control point, workers will log out of the access control computer system or coordinate with the project RCT to manually document this information if the computer system is inoperable or unavailable.

Exiting the Contamination Area from OSDF and SWU enclosed cab equipment parking/staging area:

After parking equipment in staging area, driver will exit vehicle and proceed directly

to the radiological control point. Personnel will doff the shoe covers they are wearing. After doffing the shoe covers, the gloves will be removed and the driver will proceed with the above listed Contamination Area exit requirements.

If it becomes necessary for a driver to exit the vehicle within the Contamination Area, other than the location which is provided for exit from the Contamination Area (emergency or equipment broke down), all work activities in that area are to cease until the driver is successfully removed from the area (as coordinated with through FDF Radiological Control). The driver will be escorted out of the Contamination Area and may re-enter the area, after donning the appropriate level of PPE, to access the truck for maintenance/support.

C.2.4.4 Exiting Controlled Areas

To exit the Controlled Area workers must monitor through a personnel contamination monitor (PCM). All material exiting the Controlled Area must be surveyed.

After successfully monitoring through the PCM, the workers will log out of the access control computer system or coordinate with the project RCT to manually document this information if the computer system is inoperable or unavailable. The workers shall then place their TLD in the appropriate slot of the TLD storage rack (slots are labeled with badge numbers).

Exiting from the OSDF Material Transfer Area (Controlled Area):

Personnel will exit the Controlled Area through the Controlled Area access/egress point. Any assistance required for exiting the Controlled Area may be obtained from the FDF Radiological Control personnel located at the OSDF radiological control point. Personnel will proceed through the PCM and log-out/badge-out of the Controlled Area.

1. If an equipment driver from the Material Transfer Area encounters difficulties while within the Contamination Area (emergency or vehicle break down) and it becomes necessary to exit the equipment/vehicle while within the Contamination Area, other than the location which is provided for exit from the Contamination Area, all work activities in that area are to cease until the driver is successfully removed from the area (as coordinated with through FDF Radiological Control). Shoe covers and gloves will be obtained for the driver who will be escorted out of the Contamination Area and may re-enter the area, after donning the appropriate level of PPE, to access the truck for maintenance/support.

C.2.5 Specific Project Area Requirements

C.2.5.1 Impacted Material Haul Road

The haul road will be posted as a Contamination Area and controlled as such for the entire time of use for hauling materials from the Southern Waste Units to the OSDF.

Entry on to the Haul Road from OSDF, SWU, or other stockpile areas:

The build up of dirt or mud on haul vehicles or the Haul Road will not be permitted. Contractor will provide the necessary controls to prevent this occurrence.

1. An Equipment Wash Facility and water line will be provided which the Contractor may use to wash trucks or haul vehicles to remove dirt and mud prior to proceeding from the SWU or OSDF on to the Haul Road.

In addition, the contractor will be required to adhere to dust generation limitations which including provisions to dust emission controls from paved roadways.

Routine radiological surveys will be performed by FDF project RCTs on the Haul Road to document contamination levels and evaluate the adequacy of the contractor's cleaning efforts. Similar surveys will also be performed on the haul vehicles during periods when the vehicles are parked or not in use (during breaks, lunch, or at the end of the work day).

Crossings of the Haul Road by OU-1 (Waste Pits Project), OU-4 (K-65 Silos), or Waste Management (KC-2 Warehouse) areas:

During the use of the Impacted Material Haul Road by the Contractor, other projects are provided crossing points requiring interface between the SWU/OSDF project and others. Each crossing will take approximately 5 minutes and will be performed at times between impacted material vehicle hauling intervals at the particular crossing point and is generally not expected to cause impact to Impacted Material Haul Road haul vehicle flow. Interaction will only be required during hours when material hauling is occurring along the Impacted Material Haul Road.

The crossing support will be provided by others. Two swing gates will be located on either side of the crossing point (with the exception of the crossing point for Waste Management (KC-2 Warehouse) to indicate to Impacted Material Haul Road traffic when crossings are occurring. During the off-shifts or off-months the crossing point will be left open for crossing access until such time as the material hauling activities recommence.

C.2.5.2 OSDF and SWU Work Activities

C.2.5.2.1 OSDF and SWU Enclosed Cab Equipment Parking/Staging Area

A designated equipment parking/staging area at the OSDF and SWU will be established for parking of only enclosed cab vehicles used within the project Contamination Areas whose drivers are observing the reduced radiological controls and requirements for enclosed cab equipment in Contamination Areas. This area should be immediately adjacent to the Radiological Control Point Facility (RCPF) for the associated Contamination Area. The lot and path from the haul vehicle parking/staging area to the RCPF should be graveled or designed

to prevent potential cross contamination hazards to personnel required to access the area. Vehicle access to this area will be restricted to only those vehicles that meet this criteria.

A routine radiological survey (daily) will be performed by FDF Radiological Control on the equipment that are staged in this area during idle periods (lunch, breaks, end of shift). Survey results that indicate contamination levels above the limits listed in Table 1 (below) will require cleaning of the interior prior to allowing use with drivers wearing only shoe covers and gloves to access the vehicle.

The impacted material haul vehicles for the SWU shall be fitted with automatic bed covering systems. The driver will not be permitted to exit the vehicle to operate the bed covering system. The bed covers will be in place at all times with the exception of during vehicle loading or unloading activities.

C.2.5.2.2 OSDF Material Transfer Area

All haul vehicles that are to be used within the Material Transfer Area will remain within the Controlled Area with the exception of the time in which the vehicle is in the OSDF Contamination Area to deliver materials from the OSDF Material Transfer Area. The designated parking location for this haul vehicle will be established within the OSDF Material Transfer Area.

A routine radiological survey (daily) will be performed by FDF Radiological Control on the area, haul vehicles, and containers that are staged in this area during periods in which the vehicles are idle (lunch, breaks, end of shift).

The drivers will be permitted to drive into the Contamination Area for ROB delivery/unloading with reduced radiological and PPE requirements (with the exception of shoe covers and gloves) as long as the same vehicle enclosed cab requirements within this contract that permit reduced controls and requirements are applied.

After unloading the container, the driver will exit the Contamination Area at the OSDF Decontamination Facility. The haul vehicle will be decontaminated and radiologically surveyed to permit exit of the vehicle from the Contamination Area into the Controlled Area. The exchange of containers may then occur at the OSDF Material Transfer Area.

The survey time for each truck exiting into the Controlled Area under these controls is expected to be approximately 5 minutes. The vehicle wheels, wheel wells and gate on the bed of the container will be the main concentration of this survey. The survey time will be affected by the amount of dirt and mud on the vehicle at the time of exit and the level of effort put into maintaining the vehicle free of dirt and mud during delivery of materials from the Material Transfer Area and exit cleaning/maintaining the haul vehicles.

When determining the type of vehicle to be used in handling materials coming from the OSDF Material Transfer Area (ex large fork truck, roll-off box handling truck, truck and flatbed trailer) an evaluation in terms of ease of decontamination should be considered prior to use.

Equipment with inaccessible surface around the wheels and wheel wells may be more difficult to decontaminate and release from the Contamination Area back to the Material Transfer Area. The methods of material handling and types of vehicles to be used shall be relayed in the Safe Work Plan including the controls to be implemented for these vehicles when accessing the OSDF Contamination Area.

The containers located within the Material Transfer Area shall be fitted with covers or capable of being closed. The driver will not be permitted to exit the vehicle to close the container or operate the container covering system while within the Contamination Area. The bed covers will be in place at all times with the exception of during vehicle unloading activities.

C.2.5.2.3 OSDF and SWU Equipment Maintenance and Refueling

Maintenance on equipment will require coordinating the work in an area that permits the safe performance of the maintenance activity by the appropriately trained personnel.

Maintenance within a Contamination Area:

> The maintenance area and portion of the equipment to be maintained shall be decontaminated to levels that are ALARA (or contamination levels evaluated to ensure that levels are ALARA) as determined by FDF Radiological Control prior to the performance of maintenance. The level of PPE and controls required for the performance of the maintenance will be directly affected by the level of effort put forth in the contamination control of the maintenance area and decontamination of the equipment. Minimum requirements in this case are a full set of anti-Cs.

Maintenance within a Controlled or Soil Contamination Area:

> FDF Radiological Control shall be contacted prior to the performance of Controlled Area or Soil Contamination Area maintenance. The work will be evaluated to determine the contamination levels on the equipment being maintained and any requirements implemented prior to the maintenance occurring (up to and including decontamination or requiring the maintenance to occur within a Contamination Area). The radiological requirements for maintenance in these areas will not include the use of anti-Cs to perform work.

Refueling of equipment may occur at the Controlled Area or Contamination Area boundary with the support of an FDF RCT. Fuel trucks will not be permitted within the SWU/OSDF project Contamination Areas.

An FDF RCT will be contacted prior to breaching a radiological boundary for refueling purposes. The RCT will provide the necessary support to survey the materials entering the project areas (refueling truck hose and nozzle) back out of the area.

C.2.6 Requirements for Materials, Tools, and Equipment in Contamination Areas and Controlled Areas

C.2.6.1 Bringing on Site and Use of Materials, Tools, and Equipment

All possible shipping and packing materials will be removed upon receipt at the site prior to entering a Controlled Area or Contamination Area to minimize contaminated waste generation.

The Contractor must provide FDF with a list of all tools, vehicles, equipment and material to be brought on site which have been used in conjunction with radioactivity in the past. The list must be submitted as soon as known but no less than 30 days in advance of bringing the item on site. FDF reserves the right to reject the Contractor's request to bring these items on site. All Contractor furnished tools, vehicles, equipment, and material may be inspected for radioactive contamination by FDF personnel prior to commencing work on this project. Include on the list such information as:

Previous use of the equipment.
Dates of use.
Levels of contamination.
Radioisotopes involved.

Note: Any tools or equipment contaminated with a radioactive material other than < 1% enriched uranium will be rejected.

It is the Contractor's responsibility to evaluate materials, tools, and equipment for ease of decontamination and disassembly, which may be required for decontamination, prior to use on-site. Use of items intended for future unrestricted release (i.e. those other than expendable as defined in Part 4 of the Subcontract, Special Terms And Conditions, SC-11) should incorporate appropriate precautions to prevent contamination which should be implemented prior to and during use. Issues to consider in the evaluation include, but are not limited to:

Internal combustion equipment subject to contamination should make use of pre-filters or have a separate source of outside air on the intake.
High volume air handling equipment such as blowers, compressors, etc. shall have a filtered inlet to minimize the potential for internal contamination due to build up of low level radioactivity. Vents for air cooling shall be covered in a similar manner.
Protective sheathing/covers, strippable coatings, or protective caps should be used to minimize the potential for contamination (e.g., coating the buckets of man lifts or other walking/standing surfaces). In addition, all openings on equipment, tools, or vehicles that may permit contamination of inaccessible or difficult to clean areas shall be covered and protected.

For the purposes of meeting the "As Low As Reasonably Achievable" (ALARA) goal for tools, equipment, and materials, it is expected that all reasonable efforts are used to control residual contamination to the extent that there is no detectable contamination on items that were free of contamination prior to use or there is no increase in the level of contamination on items that were previously contaminated and allowed to be used. The contamination levels will be evaluated using standard field survey instruments when the items are no longer required for use. The Contractor shall include in the Safe Work Plan methods to prevent contamination

and methods of decontamination. Reasonable efforts to control contamination include, but are not limited to, the following:

Plan and coordinate all work to minimize exposure of equipment, tools, and vehicles to potential radioactive contamination.
Protective measures prior to use of items.
Preventative measures while items are being used.
Decontamination upon completion of work activities.

The Contractor shall submit the manufacturer's technical information for any decontamination or contamination controlling agents for compliance review prior to use. This information shall include:

Material to be used.
Intended use.
Application instructions.
MSDS Sheets.

Decontamination or contamination controlling agents shall arrive on site in original, new and unopened containers bearing the manufacturer's label and include the following information:

Name or title of material.
Manufacturer's stock number and date of manufacture.
Manufacturer's Name.
MSDS Sheets.

C.2.6.2 Release of Materials, Tools, and Equipment From Site

All items are considered potentially contaminated if they have been used or stored in areas that could contain unconfined radioactive material (Controlled or Contamination Areas). The Contractor shall perform all decontamination activities required for FDF to verify that the surface contamination levels are in compliance with limits identified in Table 1 of this section and that the item has been subjected to the ALARA process. The Contractor is to provide a minimum of 24 hours prior notice to FDF of intent to remove tools and equipment from a Controlled or Contamination Area. FDF will perform final verification surveying.

The Contractor should assume that extensive dismantlement and an aggressive decontamination effort may be required to achieve unrestricted release of items that have come in contact with radioactive material or were used extensively in contamination areas. Based on past experience using the best available technologies, decontamination and survey access requirements to meet the release criteria may be difficult to achieve.

The Contractor shall furnish all equipment, tools, and material required to perform the work described in the subcontract except where the contract explicitly states FDF will provide the item.

If contamination in excess of the limits of Table 1 is present on the tools, equipment, or material, then the items must remain in the area for decontamination. If decontamination has been attempted by the contractor and has been unsuccessful, the effected items will be retained by FDF (in accordance with Part 4 of the Subcontract, Special Terms and Conditions, SC-12).

Tools and equipment may be released with the approval of a FDF Material Release Evaluator if all of the following have been met:

Residual radioactivity is at or below the limits identified in Table 1.
All areas must be readily accessible for survey for residual radioactivity including proper surface counting geometry to allow for accurate quantification. Items with inaccessible areas which are likely to be contaminated but are of such size, construction, or location as to make them inaccessible for survey shall be assumed to exceed the limits for release. The item must either be disassembled to permit an adequate survey to certify that internal contamination is at or below the limits of Table 1 or well documented process knowledge can be applied to provide confidence that contamination in inaccessible areas is not probable.
The decontamination effort performed was such that the residual levels of radioactivity are as low as reasonably achievable and further significant reduction in radioactivity would require unreasonable efforts.

Items that do not meet the limits of Table 1 may be released to an Off-Site Licensed Facility if the following are met:

If the Contractor possesses the appropriate license to receive, possess, use, and transfer the equipment, tools, material, or vehicles with radioactive contamination, Contractor may elect to remove such items from the site in lieu of decontamination. The responsibility of complying with all state, local and federal regulations during the packaging, shipping, and receipt of the equipment shall be the responsibility of the Contractor. The Contractor shall submit a copy of the license and applicable procedures to FDF for compliance review prior to removal of the contaminated equipment. A copy of all Bills of Lading shall be submitted to Fluor Daniel Fernald prior to shipment.
The Contractor is to provide 24 hours notice to FDF prior to shipping radioactive tools, equipment, and/or material.

If FDF determines that the Contractor has implemented the requirements of this Section and the Safe Work Plan and the Contractor's decontamination efforts are unsuccessful or decontamination is not practical (as identified below), refer to Part 4 - Special Terms And Conditions, Disposition of Subcontractor Provided Equipment, Tools, and Materials That Have Become Contaminated (SC-11) for action to be taken.

Decontamination may be considered impractical for non-expendable items that are integral parts of equipment and not readily replaceable such as porus materials (e.g. wood and fiberglass), wire rope, chains, brushes, items with finned surfaces, and

similar items where contamination may be embedded within the material configuration matrix. These items may not be released if detectable contamination is identified on the surface.

Decontamination Area Requirements:

The following are examples of options for establishing outdoor decontamination areas for equipment and materials exiting Contamination Areas.

1. Utilize a pad with a temporary containment area or wash water run-off controls
   a. Containment must have a bermed perimeter to ensure runoff control.
   b. Containment used must be adequate to maintain its integrity.

2. The Contractor shall control and manage all waste and effluent generated while removing contamination in accordance with the requirements listed in Part 7 - Technical Drawings and Specifications.

Methods of Decontamination Activities:

If decontamination becomes necessary, the Contractor should at a minimum use the following as applicable:

1. Dry cleaning.

2. Steam cleaning.

3. Hot water pressure washing (may be used in conjunction with abrasive techniques and approved decontamination agents).

When selecting a decontamination technique other than those previously identified above, consideration should be given to those technologies which minimize radiological airborne emissions, secondary wastes, and tool or equipment damage.

As an alternative to decontamination, replacement of contaminated components shall be in accordance with the requirements of Part 4 - Special Terms And Conditions, Disposition of Subcontractor Provided Equipment, Tools, and Materials That Have Become Contaminated (SC-11). Actual disposal of the contaminated components will be provided by FDF.

C.2.7 Minimum Radiological Requirements for Project Personnel to Access and Work Within a Controlled Area or Radiological Area

Contractor personnel requiring access to the Controlled Areas or Radiological Areas are to be trained radiological workers meeting requirements of 10 CFR 835 and DOE Radiological Control Manual (approved FDF training programs are available). Workers are to participate in FDF DOELAP accredited personnel dosimetry and bioassay program, and respiratory

protection and medical requirements associated with the programs.

C.2.7.1 Project Personnel Radiological Monitoring and Surveillance Requirements

All project personnel who perform work in a Controlled Area must participate in the following personnel monitoring and surveillance programs:

TLD: The Contractor must provide FDF with the number of personnel in need of TLDs at least five working days prior to the need for TLDs; and

Baseline, incident and termination urinalysis

All project personnel who perform work in a Radiological Area must participate in the following FDF personnel monitoring and surveillance programs:

TLD;

Baseline, every 60 days, incident and termination urinalysis; and

Baseline, annual, incident and termination In-Vivo examination.

Baseline fecal samples are required for any worker who has a history of exposure to thorium.

C.2.8 Radiological Work Permits (RWPs)

Prior to commencing with any field activities, the Contractor shall obtain the appropriate work permits to begin the work. Every activity performed by the Contractor must be covered by a work permit.

Work permits are initiated by FDF based upon discussion with the Contractor regarding upcoming work. FDF fills out a FEMP work permit with the appropriate information such as job location and detailed job description. The description must be specific enough to allow the job to be evaluated by health and safety personnel so that they can assign proper controls for the job. From this work permit, all necessary safety permits may be generated.

RWPs will be generated by FDF. Work may not begin until the appropriate RWP is in place. The RWP informs workers of area radiological conditions, work controls, and entry/exit requirements. RWPs are required for activities at FEMP that include, but are not limited to:

Entry into any radiological area as defined in 10 CFR 835;

Breaching of any process line, tank, vessel, or enclosure containing radioactive materia that may become loose or airborne during the work;

Any work within the controlled area on contaminated or potentially contaminated

equipment where safety precautions are not adequately discussed in technical work documents approved by FDF Radiological Control;

Decontamination of highly contaminated equipment;

Digging or disturbing soil in a Soil Contamination Area; and

Breaking the barrier of a Fixed Contamination Area.

All workers must be briefed by an RCT on the contents of each RWP under which that worker will perform work and the conditions of the work area. Workers must sign the acknowledgment sheet one time (per revision to the RWP) to indicate an understanding of the requirements of that RWP.

Workers will sign the daily sign in sheet on the RWP applicable to the work they are going to perform prior to entering the work areas, and will sign out upon exiting these areas. With reference to the daily sign-in sheet, a worker may only be signed-in on one RWP at a time.

C.2.9 Personal Protective Equipment (PPE) and Contamination Clothing Requirements

PPE and requirements anticipated for general work activities are outlined in the EHS&TRM. Final requirements for a particular task will be specified in work permits or Safe Work Plans based on the existing radiological conditions and scope of work.

The Contractor shall maintain a set of hard hats designated for use in Contamination Areas only. Additional requirements for hard hat usage include the following:

When a hood is required, hard hats will be worn over the hood;

Storage of hard hats in posted Contamination Areas is allowed for hard hats worn over hoods. The hard hats shall be periodically monitored by an RCT; and

If a hard hat storage area has not been established within the Contamination Area, hard hats shall be doffed (at the control point step-off pad) by individuals exiting these areas. The individual shall turn the hard hat over to an RCT for survey and release.

Specifications for FDF-approved consumable contamination clothing are included in Part 7.

All cloth and consumable anti-Cs are removed after one use (i.e., whenever a worker exits a Contamination Area). Consumable anti-Cs are disposed; launderable anti-Cs are segregated for return to the laundry.

C.2.9.1 Contamination Clothing

The five types of garments that could be specified for likely work conditions at the FEMP are listed below:

1. Lightweight, disposable: barrier to particulates (radiological and other), asbestos, and lead. This is a breathable type garment which aids in the evaporation of perspiration. Lightweight disposables shall not be worn as an outer layer for protection from liquids or chemical hazards, or when wet conditions can be expected.

   Lightweight disposables shall never be worn as a single layer of anti-Cs. In cases where these anti-Cs are needed, such as asbestos work, a double layer of anti-Cs is required.

2. Waterproof, disposable: used as a barrier for casual or indiscriminate contact with water or liquids (i.e., mist from spray, wet surfaces, dew, etc.). The waterproof coverall has design specifications for breathability which allows minimization of heat stress concerns when waterproof protection is required. This waterproof coverall shall not be used when repeated or prolonged contact with water is expected.

   During summer heat season, typically May through September, waterproof anti-Cs may be required as the outermost layer of protection when the nature of the work and area conditions exhibit the potential for perspiration and subsequent degradation of particulate barrier types. If a chemical hazard is present, then the outer layer will be specified by FDF Industrial Hygiene.

3. Chemical protective, disposable or reusable: used as barrier to liquids, particulates, and specified chemicals. This type of shall be used for:

   extremely wet conditions when repeated or prolonged contact with liquids can be expected; disposable "rain suits" and Saranex aprons are other types of waterproof disposables that will be required for specific situations requiring proximity protection;

   protection from specified chemicals or radiological/chemical hazards such as uranyl nitrate, thorium nitrate, or other corrosive or acidic materials; and

   contact with contaminated grease, oil or other similar types of surface contamination.

   When double's are required and water-proof's (or Saranex type) are necessary for a particular job, any type of garment can be worn as the inner layer of protection.

   NOTE: Radio belts or other objects worn on the outside of Saranex coated Tyvek chemical protective coveralls can degrade or "strip" the Saranex coating from the Tyvek base reducing the protective properties of the garment. Care shall be taken to avoid these situations by placing radio belts (or other) as to avoid direct friction with the Saranex coating. If the object can be worn on the inside of the garment, this would be preferred. If it cannot, a method to consider is the placement of a barrier (duct tape or other appropriate material) between the object and

the outer surface of the Saranex garment.

NOTE: Rubber shoe covers worn directly over Saranex booties has had the same effect. RWPs and Safe Work Plans must account for this whenever Saranex coveralls are required and contact with liquids in the foot area is possible.

4. Fire retardant, launderable or disposable: used as protection when performing "hot work". The launderable types are normally constructed of Nomex (or other materials approved by FDF Fire Protection Engineering). Any individual performing welding or burning activities ("hot work") in Contamination, High Contamination, or Airborne Radioactivity Areas is required to wear flame retardant disposables or the orange flame retardant launderable coveralls. This color designation has been approved for flame retardant garments only. Green is the color designation for welder coveralls when contamination clothing is not required. Select disposables for "hot work" will be approved on a case-by-case basis by FDF. Inner waterproof or chemical protective may be required on a case-by-case basis when other workplace hazards are present.

   When double sets of anti-C clothing are required, welder coveralls will serve as the outer layer of protection.

5. Other launderable types: used as a barrier to particulate forms of radiological contamination. Constructed with cotton, cotton/polyester blends, or nylon fabrics. Depending on the garment type, it may be a durable rubberized material. Cotton, cotton/polyester-blend, or nylon fabric types shall not be used as an outer or single layer of protection from liquids or chemical hazards, or when wet conditions can be expected. Cotton, cotton/polyester-blend, or nylon fabric types shall not be worn as a single layer of protection for heavy work activities which require repeated, prolonged, or continuous contact with contaminated surfaces.

C.2.9.2 Gloves

The specified glove types for radiological work are nitrile or neoprene. Outer cotton or leather work gloves are required for hands on work where physical hand protection from sharp or rough work surfaces or abrasion resistance is needed. Cotton liners may be worn with these glove types for comfort purposes, but are not considered as a layer of radiological protection. Other types of gloves may be specified by Industrial Hygiene for physical hand protection and for protection from specified chemicals. All gloves used in Contamination Areas must be disposed of in appropriate waste containers and shall not be permitted to leave areas posted for contamination.

C.2.9.3 Rubber Overshoes

FDF provided launderable rubber shoe covers will be required over booties. In uranium areas, used shoe covers will be segregated for return to laundry.

For muddy Contamination Area work or work in Contamination Areas where liquids have accumulated, the Contractor must provide knee high over boots, or an FDF approved equivalent that extends above the ankles in lieu of the rubber shoe covers. Decontamination and storage of these items in the Contamination Area at the control point for subsequent reuse is encouraged. For reuse, the protective clothing must be worn on the outside of typical anti-Cs and the Contractor shall maintain the inside surfaces of these items below the removable contamination limits of Table 1.

C.2.9.4 Respirator Requirements

In general, full face air purifying respirators (FFAPR) will be required for airborne generating activities in conjunction with engineering controls to maintain exposures to ALARA. FFAPRs may be used up to a concentration of five DAC . Powered Air Purifying Respirators (PAPRs) may be used to a concentration of 100 DAC. Above 100 DAC, work will be stopped until adequate controls are implemented to reduce the airborne concentration.

PAPRs, as a minimum, are required for all torch cutting activities involving cutting of contaminated materials .

For the purposes of radiological control, all respirators are required to have HEPA-filter cartridges.

C.2.9.5 Donning and Doffing of Protective Clothing

The following requirements apply to donning and doffing of protective clothing:

Each individual required to wear garments shall don and doff these garments as taught in Radiological Worker Training;
Cleaned PPE and laundered protective clothing shall be inspected by the worker prior to use. Anti-Cs shall be free of tears, holes, separated seams, missing buttons or zipper damage, or repaired in a manner that provides the original level of protection;
Anti-Cs shall not be worn in Controlled Areas unless worker is donning anti-Cs for entry through a control point into Contamination or Airborne Radioactivity Areas; and
While in a Contamination Area, workers will not expose any area of their bodies or clothing, protected by anti-C clothing, except for the act of doffing anti-Cs at the control point with the intention of leaving the Contamination Area, or where authorized in a heat stress control room.

C.2.9.6 Special Considerations

The following special considerations apply to use protective clothing:

A face shield and waterproof hood is required when a reasonable potential exists for liquids to splash in the facial and head area (OSDF Decontamination Facility and Impacted Material Haul Road vehicle wash pad (if spray washer is used)). If a full-face respirator is being worn, the face shield is not required;

To minimize heat stress potential, may be placed directly over modesty clothing or undergarments;
Areas located below unprotected or open overhead work must be posted with barrier rope or tape and appropriate restrictions must be placed on personnel access. A hard hat and the same level of protection (as workers above) is required;
Cold weather gear (coats, jackets, etc.) must be worn under clothing, unless the gear is an approved garment;
Personal head gear (i.e., scarfs, kerchiefs, baseball caps, etc.) must be maintained so that no part of the head gear comes in contact with the exterior surfaces of anti-C clothing. When a hood or skullcap is required, the affected piece of personal head gear must be completely covered; and
Long hair which extends below the collar of anti-C clothing shall be maintained or covered by anti-C protection.

C.2.9.6.1 OSDF Contamination Area Work Special Considerations

Summary of PPE Requirements for Soil and Debris Handling Activities (to include above WAC and below WAC soils):

Equipment Drivers Within Enclosed Cabs:

1. Anti-C requirements:

   a. In enclosed cab when within a Contamination Area as long as windows remain shut at all times.

   b. Drivers will not be permitted to get out of vehicle or open windows at any time except after the driver exits the Contamination Area. The driver will be required to contact an RCT prior to exiting the area. If a situation arises during the performance of work requiring the driver to exit the vehicle while still in the Contamination Area, the driver must contact an RCT to assist in getting out of the area.

   c. If conditions in item a above cannot be met drivers will be required to wear a full set of anti-Cs (minimum) during the performance of work.

2. Respiratory protection requirements:

   a. Respirators will not be required under what is expected to be normal operations. All drivers will be required to wear a breathing zone air sampler (BZA) for radiological occupational monitoring purposes. Respiratory requirements will be re-evaluated based on variations in dust or BZA monitoring results.

Equipment Drivers NOT Within Enclosed Cabs:

1. Anti-C requirements:

   a. All equipment drivers in the Contamination Area not within enclosed cabs will be required to wear a full set of anti-Cs (minimum) during the performance of work.

2. Respiratory protection requirements:

   a. Respirators will not be required under what is expected to be normal operations. All operators will be required to wear a breathing zone air sampler (BZA) for radiological occupational monitoring purposes. Respiratory requirements will be re-evaluated based on variations in dust or BZA monitoring results.

Field support personnel (on foot):

1. Anti-C requirements:

   a. All personnel on foot in the Contamination Area will be required to wear a full set of anti-Cs (minimum).

   b. Knee high rubber work area boots (or approved alternative) may be required in the area based on soil conditions (mud above ankle).

2. Respiratory protection requirements

   a. Personnel performing field work within 50 feet of any active dumping operation (to include any heavy equipment dumping or loading activity and manually loading or unloading containers) will be required to wear respiratory protection, otherwise respirators are not expected to be required. 25% of personnel in each work group (minimum) will be required to wear a breathing zone air sampler (BZA) for radiological occupational monitoring purposes. Respiratory protection requirements will be re-evaluated based on variations in dust or BZA monitoring results.

All work controls in the scenarios described herein only apply to Contamination Areas on the project. If a work area must be up-posted to a High Contamination Area, these work controls will no longer apply and the work within that area will be re-evaluated for implementation of proper radiological controls.

An increased sensitivity to minimization of emissions in above WAC excavations debris handling is necessary. The extent and level of effort put forth in the implementation of dust control plan (proactive approach) will greatly reduce the need for respiratory protection.

Enclosed cab is defined as vehicle cab isolated from outside environment (intact windows, doors, panels, and floors surrounding driver with all windows and doors shut) which provides

a barrier from intrusion of outside airborne particles. Any HVAC (heating or air conditioning) units associated with the vehicle cab must not provide a direct path for outside air to enter (air conditioner on air recirculate mode) or HEPA filter the air if pulling directly from outside the cab. FDF approval is required prior to implementing the reduced Contamination Area controls and requirements for any enclosed cab equipment. If the equipment cab is not approved by FDF as an enclosed cab then the equipment driver will not be permitted to operate the equipment within the Contamination Area under the reduced controls and requirements.

A full set of anti-Cs for operators includes cloth yellow anti-C coveralls, nitrile gloves, booties, rubber shoe covers, and hood (skull cap may be worn in place of hood). All openings will be taped. Water resistant coveralls will be required in place of cloth if working in wet conditions or if personnel are sweating through cloth anti-Cs (as determined by FDF RCT supporting in the field).

FDF Radiological Control to supply and maintain project breathing zone air samplers used for radiological occupational air sampling purposes.

A full set of anti-Cs for field personnel includes cloth yellow anti-C coveralls, nitrile gloves, booties, rubber shoe covers (knee high rubber boots if mud is above the ankle), and hood. All openings will be taped. Water resistant coveralls will be required in place of cloth if working in conditions where materials are getting on cloth anti-Cs or if personnel are sweating through cloth anti-Cs (as determined by FDF RCT supporting in the field).

C.2.10 Break Rooms, Cool Down Rooms, and Heat Stress Control Rooms

C.2.10.1 Break rooms

The following requirements apply to the establishment and use of break rooms:

> No anti-C clothing is allowed in break rooms with the exception of bagged and laundered anti-Cs that are being returned to the trailers after laundering, which must be moved immediately to the changing areas/locker rooms for storage. The respirator cabinet may be in the break room for accessibility.

C.2.10.2 Cool Down Rooms

Cool down rooms may be established by the Contractor in Contamination Areas to allow workers to briefly rest in an air-conditioned or cooler environment. In cool down rooms, workers may not remove respirators, receive physiological monitoring, or obtain a drink of water. Worker entry to a cool down room does NOT require any radiological monitoring prior to entry. Cool down rooms must be maintained at removable contamination levels less than 10,000 dpm/100cm^2. Workers may not spend more than 15 minutes in a cool down room in any one hour. If a worker needs to break for more than 15 minutes, that worker must exit the Radiological Area.

C.2.10.3 Heat Stress Control Rooms

The Contractor may establish a heat stress control room in the Contamination Area with FDF approval. These areas are distinguishable from cool down rooms in that workers may remove respirators, receive physiological monitoring (pulse rate and temperature), and drink water. Physiological monitoring can be performed to determine longer on-the-job stay-times for workers based on personal temperature and pulse rather than the ambient-temperature-and-humidity method;

Worker entry into a heat stress control room requires a survey of outer anti-Cs by an RCT prior to entry of the room. Detectable contamination (above background) on the anti-Cs will prohibit the worker from entering that room. Workers in double anti-Cs (other than asbestos workers) may doff their outer set in order to enter the room. Workers in single anti-Cs with detectable contamination on them are forbidden entry into the heat stress control room;

Heat stress control rooms must be physically isolated from the rest of the Contamination Area in which it resides. The room must be maintained at removable contamination levels less than 1,000 dpm/100 cm^2. When removable contamination in excess of this limit is discovered, the room will be shutdown until it has been decontaminated;

Workers must exit the radiological area for rest periods greater than 15 minutes;

FDF shall perform air sampling in heat stress control rooms. Airborne radioactivity greater than 2% of the uranium 238 DAC will restrict the removal of respirators until it can be verified that the Contractor has lowered the airborne radioactivity to less than 2% of the relevant DAC; and

Heat stress control rooms are forbidden for use by asbestos workers.

C.2.11 Filling and Emptying Project Waste Containers (Roll-Off-Boxes, Sealands, White Metal Boxes, ISOs)

Waste containers shall be staged in the Contamination Area when loading material from within the Contamination Area or unloading containerized contaminated materials. Waste containers must be closed when not in use and always at the end of any shift. Personnel on foot working in, above, or in front of open waste containers will be in respirators (generally Full Face Air Purifying respirators). This requirement also applies to personnel handling materials that were previously wrapped or contained in plastic but exist in a condition where the plastic or wrapping has been breeched or removed. Personnel working outdoors without respiratory protection, but in the Contamination Area, must maintain a 50 foot distance from waste being transferred to the waste containers.

The openings of internally contaminated equipment shall be sealed prior to movement.

Table 1
SURFACE CONTAMINATION LIMITS[a]

NUCLIDE[f]	FIXED PLUS REMOVABLE		REMOVABLE[b,e]
	AVERAGE[b,c]	MAXIMUM[b,d]	
U-nat, U-235, U-238, and associated decay products, alpha emitters.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100 cm^2	3,000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm /100 cm^2

[a] Where surface contamination by both alpha and beta-gamma emitting nuclides exists, the limits established for alpha and beta-gamma emitting nuclides should apply independently.

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] Measurements of average contaminant should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each object.

[d] The maximum contamination level applies to an area of not more than 100 cm^2.

[e] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

[f] The limits presented for transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, and Ac-227 may be adjusted on a case by case basis. Consult Radiological Control when required to apply these limits for unrestricted release.

D. REQUIREMENTS FOR THE CONTRACTOR'S HEALTH AND SAFETY (H&S) PROGRAMS

D.1.0 Corporate Health and Safety Program

The Contractor's Corporate Health and Safety Program should include, but need not be limited to the following elements:

Description of Safety and Health Organization;
Competent Person's Qualifications Requirements;
Safety Principles;
Safety Philosophy;
Safety Training Program;
Hoisting and Rigging Program;
Fire Prevention Program;
Portable Hand and Power Tool Use and Inspection Program;
Personal Protective Equipment Program;
Electrical Safety Program;
Hazard Communication Program;
Respiratory Protection Program;
Fall Protection/Prevention Program;
Motorized Equipment Use and Inspection Program; and
Traffic Control Program.

D.2.0 Site Specific Health and Safety Program

With the Corporate Health and Safety Program as the basis, the Contractor shall submit a FEMP Site Specific Health and Safety Program (SSHSP). This document shall incorporate the site specific requirements identified in Part 8 - Environmental Health and Safety & Training Requirements. This document shall provide all necessary programs to support the work activities outlined in the Contractor's Safe Work Plan. Submission of an acceptable SSHSP shall satisfy the requirements of Part 3 - General Terms and Conditions, paragraph A.37.(b).

E. SITE ACCESS, TRAINING, AND MEDICAL SCHEDULING

E.1.0 General Training Requirements

Refer to the Environmental Health & Safety and Training Requirements Matrix (EHS&TRM), Part 8, Section A, for project specific training requirements.

The Contract Training and Medical Schedule Locations (EXHIBIT 2) gives durations, provider, schedule and location information for training courses and physicals. Where "Schedule" appears under "Time Provided" it means that training can be scheduled with the Construction Training Coordinator (CTC) on a first-come-first-served basis.

Per the Project Labor Agreement, Article 3.3,"When the unions are notified that special training or certification for work with hazardous materials is required they will refer qualified workers who have completed the required training and/or who have the required certification". This sentence of Article 3.3 refers to Fernald Site Worker and Radiological Worker I and II training.

When certified, trained personnel for work with hazardous materials are not available, the contractor may elect to accept untrained personnel from the Unions. Under these circumstances FDF will provide, at no cost to the contractor, training facilities and instructors for FDF required training and the contractor shall be responsible for all costs (e.g. wages, fringes, etc.) associated with training their staff and craft personnel. The contractor shall submit a request 5 working days prior to training.

The cost of trainers for site specific training provided by FDF (e.g. confine space, lock and tag etc.) will be borne by FDF.

Certifications of training by a Contractor trainer must be submitted to FDF for each employee. The submittal shall be made at least four working days before site access is needed.

Equivalent Site Worker and Radiological Worker Training - Those individuals with documented proof of previous training, (i.e., HAZWOPER Training) which is equivalent to FDF Site Worker Training may receive exemption from Site Worker Training. In order to receive this exemption provide documented proof to the Construction Training Coordinator. Exemption may also be granted for Radiological Worker Training from other DOE Sites or from the GCBCTC by submitting documentation and successfully completing the FDF Radiological Worker Test and Practical. (approximately 4 hrs.)

Contractor personnel who were granted exemption to FDF Site Worker Training shall also complete the following: Construction Rules and Regulations, General Employee Training (GET), applicable Radiological Worker Training, (i.e., Radiological Worker I and II Training) and Supervised Field Experience on the FDF job site.

The Contractor's superintendent is responsible for submitting an OSHA Supervised Field Experience form, signifying completion of Hazardous Waste Site Supervised Field Experience, 29 CFR 1926.65, for each employee when GET, Site Worker Training, Radiological Worker I Training or Radiological Worker II Training is required, to FDF.

Contractor personnel required to take Radiological Worker II Training are also required to complete

Respirator Training before being certified as Radiological Worker II.

Radiological Worker I and Radiological Worker II are separate courses and do not build upon each other. Personnel are only required to take one of these courses.

Refer to Part 8, Section B.3.7, Training for PACM Handling, for related training.

In addition to project specific training shown on the EHS&TRM all Contractor and Subcontractor field supervision (Project Management, Superintendents, Construction Engineers, Construction Coordinators, Safety Personnel, or similar positions) shall take and successfully complete a certified OSHA Construction Safety Outreach 30 Hour Program course within 60 calendar days following Notice to Proceed. Training will be provided by FDF; however, those individuals with documented proof of OSHA Construction Safety Outreach training may acquire an exemption by submitting documentation to FDF. This training will also meet the requirements for 29 CFR 1926.65 Supervisor Training

Refer to Part 8, Section B, Confined Space Program, for related training.

The Contractor shall train their personnel to recognize and avoid fall hazards and in the use of control and fall arrest systems. Training shall be documented and retained in Jobsite files.

Refresher Training

1. Required refresher training is listed in EXHIBIT "2". It is the Contractor's responsibility to coordinate scheduling of refresher training with FDF.

2. GET Refresher Supplemental Courses (see Required Additional Annual Training) - Required documentation from meetings and briefings shall be submitted by the Contractor to FDF.

Computer Based Training (CBT)

Where indicated on EXHIBIT "2", training or re-training is available on computers using interactive screens. Self study booklets are available to assist in preparation for CBT Training.

E.2.0 Access Requirements

E.2.1 General Access Requirements

The Contractor's Tentative Personnel List EXHIBIT "10" is to be completed by the Contractor ten (10) days after Notice to Proceed. This provides an estimate of personnel and craft types to be expected in support of the project. At least five (5) work days prior to personnel arriving at the work site, the Contractor's superintendent should notify FDF that Contractor personnel will require access. The Request For Access Form EXHIBIT "1" is used to make this notification. This notification allows the CTC to reserve training and medical times in advance. Training and medical reservations are made on a "first come - first served" basis.

This form requires the names of Contractor personnel. Instructions for completing the form are found in EXHIBIT "1" .

Contractor personnel shall arrive at the location identified by FDF to begin the access process by 6:30 AM.

Access Badges and TLDs (if required) will be issued upon completion of access requirements as verified by FDF.

See Contract Part 8, Section B for substance abuse testing requirements related to access.

Unless otherwise noted in the Contract, escorted personnel may not perform physical work. See the EHS&TRM for escort provisions.

E.2.2 Requirements for First Time Access

The EHS&TRM identifies the minimum training and medical requirements for access. The minimum requirements for all Contractor personnel is Construction Rules and Regulations and GET.

Site Worker Training and Radiological Worker I (RAD I) or Radiological Worker II (RAD II) training and physicals, when required by the matrix, shall be taken and passed prior to being granted unescorted access to the work area.

Other training such as Confined Space and Energy Control (Lock & Tag) are not access requirements; they are requirements for performing work tasks as indicated on the matrix.

E.2.3 Requirements for personnel who have had FEMP access previously

Upon receipt of the Access Request form, FDF will review training and medical records to determine what additional training will be required.

The following guidelines will be used:

In-Vivo testing will be required for Radiological II workers after an absence of 6 months from site or if the employee has worked at another nuclear facility since leaving the site;
Medical testing will be required for Radiological II workers after an absence of 1 year from site;
Medical history update will be required for each request (approximately 1 hour); and

Training will be in accordance with refresher requirements in EXHIBIT "2".